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**The Measurement of Suggestibility in Adults with Intellectual
Disabilities:**

**An Adaptation of the Gudjonsson Suggestibility Scales and a
Systematic Review Exploring the Influence of Cognitive
Variables**

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THE UNIVERSITY
of EDINBURGH

Doctorate in Clinical Psychology

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DClinPsychol Declaration of Own Work

Name:	Hannah Lydia Shackleton
Title of Work:	The measurement of suggestibility in adults with intellectual disabilities: An adaptation of the Gudjonsson Suggestibility Scales and a Systematic Review exploring the influence of cognitive variables

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Chapter 1: Thesis Portfolio Abstract

Background: The tendency for accepting and/or behaving under the influence of other's suggestion in an interview context can be described as 'interrogative suggestibility' (IS). The Gudjonsson Suggestibility Scales (GSS) are used within many clinical and forensic settings as a tool to gauge the reliability of information obtained during interviews. Concerns exist regarding the suitability of these scales for use amongst the population of people with an intellectual disability (ID). Previous research concludes that the GSS may disadvantage people with an ID, indicating a greater degree of IS than is actually the case.

Method: The following systematic review of several electronic databases explores research to date (and what conclusions have been drawn) in relation to the degree to which cognitive variables relate to scores obtained on the GSS by people with an ID. The subsequent empirical study makes adaptations (e.g. supplementing verbal information with visuals) to the GSS in an attempt to improve its suitability for use with people with an ID. In addition, a number of cognitive variables are measured (e.g. verbal and visual memory) and their relationship with scores on the scales explored.

Results: The adaptations to the GSS did not result in a significant change to scores on the GSS. It was found that visual memory ability may contribute to whether visual information effects scores on the GSS following adaptations. Whilst tentative conclusions are drawn regarding the role of memory ability, the systematic review of research was limited in it's clarification of the role of cognitive variables in IS. This is likely due to limited scope and quality of existing research.

Conclusion: Both the empirical study and the systematic review highlight the complexity of the field of interrogative suggestibility, particularly amongst people with an ID.

Chapter 2: Thesis Lay Summary

Background: Research has found that the way that questions are asked can affect the answers that a person gives. Some people may be particularly vulnerable to changing their answers or agreeing with questions, depending on how they are phrased (this is called ‘interrogative suggestibility’). Researchers have suggested that people with intellectual disabilities can be more susceptible to this than people who do not have an intellectual disability. A tool called the Gudjonsson Suggestibility Scales (involves a story being read to a person followed by some questions) is often used to measure the extent to which a person might be influenced in this way. However, there are concerns that the scale can over-estimate this tendency in people with intellectual disabilities.

Method: This portfolio involved reviewing several electronic databases and exploring research to date (and what conclusions have been drawn) in relation to the degree to which certain mental abilities (e.g. memory for visual information) influence how people with intellectual disabilities perform on the Gudjonsson Suggestibility Scales. The other part of this research portfolio sought to find out whether making certain adaptations to the Gudjonsson Suggestibility Scales (e.g. including pictures to the story to see if it would help people remember it better). In addition, a number of mental abilities were measured (e.g. how well people can remember verbal and visual information) and their relationship with performance on the scales explored.

Results: The adaptations to the Gudjonsson Suggestibility Scales did not result in a significant change to scores. It was found that visual memory ability might contribute to whether visual information improves people with an intellectual disability’s performance on the Gudjonsson Suggestibility Scales following adaptations. Whilst tentative conclusions are drawn regarding the role of memory ability, the systematic review of research was limited in its clarification of the role of certain mental abilities in interrogative suggestibility. This is likely due to limited breadth and quality of existing research.

Conclusion: Both parts of this thesis portfolio highlight the complexity of the field of interrogative suggestibility, particularly amongst people with an intellectual disability. There is a need for further research to further clarify the roles certain mental abilities play in interrogative suggestibility.

Chapter 3: Systematic Review Journal Article

Association of cognitive variables and interrogative suggestibility within the population of those with intellectual disabilities: A systematic review

Written in accordance with author guidelines for:
Journal of Applied Research in Intellectual Disability (JARID; see Appendix A).

Abbreviated title for running head:
Cognitive variables and suggestibility: a review

Keywords:

Suggestibility

Interrogation

Intellectual disability

Cognitive

Individual differences

Neuropsychology

Systematic Review Abstract

Background: The use of the Gudjonsson Suggestibility Scales (GSS) for assessment of interrogative suggestibility (IS) for people with an intellectual disability (ID) has been criticised. Several studies have suggested that the GSS does not have ecological validity, instead reflecting cognitive limitations for material presented verbally. This systematic review evaluates literature examining relationships between cognitive variables and the GSS in samples of people with an ID.

Method: A systematic literature search across several electronic databases from 1980 until January 2017 using pre-specified inclusion criteria and study quality evaluation criteria.

Results: Nine studies met inclusion criteria. Nine measured memory capacity, two measured language ability and one examined verbal and performance IQ. Findings allude to the role of memory, but theoretical inferences from all cognitive variables are limited due to the inadequate measures used.

Conclusions: Research examining the role of cognitive factors in the IS of people with an ID is limited in both scope and quality.

Introduction

Interrogative suggestibility (IS) can be described as the propensity to accept suggestive information in a closed social interaction. The acceptance of suggestive information includes, often unknowingly, responding to leading questions and/or allowing interviewer feedback to influence responses. Gudjonsson and Clark (1986) developed a trans-population theoretical model of IS which proposes that susceptibility to IS is mediated by an individual's cognitive ability, mental state and personality characteristics. Gudjonsson and Clark (1986) claim that because individuals who have little, or temporarily impaired, information processing capacity have limited encoding and retrieval structures, the availability of frames of reference to use during interrogative questioning, about a previously witnessed event, is compromised.

The Gudjonsson Suggestibility Scales (GSS; Gudjonsson, 1984) are a widely studied and used means of assessing IS. The GSS consists of a short narrative that is read to individuals, followed by a request that they state everything they can recall about the story immediately afterwards and again approximately 50 minutes later. Individuals are then asked a number of questions, some of which are leading questions that suggest that certain information was presented in the story when it was not. The questions are asked twice, once before receiving negative feedback, and once after. The negative feedback implies that the individual could be more accurate and as such requires them to answer the questions again. Six scores are provided by the GSS: immediate recall score; delayed recall score; yield 1 score (number of leading questions a person yields to before negative feedback); shift score (number of times a person changes their original response as a result of negative feedback); yield 2 score (number of leading questions which the person yields to after the negative feedback); and finally, a total suggestibility score (the sum of yield 1 and shift scores). It is recognised that different psychological processes underpin each of the component scores on the GSS. For example, recall and yield scores are thought to relate more to cognitive processes (Milne, Clare & Bull, 2002) whereas shift scores are thought to be more influenced by social factors, an individual's coping processes, personality characteristics such as social desirability and neuroticism (Gudjonsson, 1983; Bain & Baxter, 2000; Polczyk, 2005; Drake, 2010). Findings such as these are in line with Gudjonsson and Clark's

(1986) model of IS, implying that cognitive abilities are more important for coping with suggestive questions than for dealing with negative feedback.

The GSS are used as a measure of IS for people with an ID in situations when the reliability of information individuals provide is deemed to be crucial, such as within the context of the criminal justice system (Willner, 2011; Howells & Ward, 1994). The appropriateness of these scales for people with an ID has received some criticism, particularly with regard to the scales' reliance on verbal information without taking account for this in subsequent scoring procedures (Beail, 2002). Some researchers have explored the relationship between a single score measure of cognitive functioning (e.g. IQ) and IS (as measured by the GSS) instead, however this has returned inconsistent results, with some finding negative correlations between IQ and GSS scores (Gudjonsson, 1983; Sharrock & Gudjonsson, 1993), and some not finding any significant relationships at all (Sondena, Rasmussen, Palmstierna, & Nottestad, 2010). In their research with children, Henry & Gudjonsson (2007) did not find the predicted relationship between IS and IQ; however, when they divided IQ scores into verbal IQ and non-verbal IQ their findings alluded to the role of more specific cognitive variables. They found that verbal IQ was related to performance on misleading questioning whereas non-verbal IQ was related to free recall.

Reduced cognitive functioning can also occur in the context of sleep deprivation and mental illness. Interestingly, researchers have identified relationships between IS (as measured by the GSS) and anxiety, depressed mood, and sleep deprivation (Ridley & Gudjonsson, 2012; McGroarty & Thomson, 2012; Blagrove, 1996). Whilst the authors attributed these relationships to interviewees' limited coping strategies when faced with interrogation and uncertainty, it might be argued that the role of reduced cognitive abilities (e.g. difficulties with concentration, critical analysis and decision making) associated with these circumstances are important in their influence of susceptibility to IS (as measured by the GSS).

Research exploring the variety of cognitive factors that influence IS amongst children and young people appears to be at a more advanced stage than that with people with

an ID. Given the quantity of existing studies within the general adults and child populations, a number of reviews have been published. A systematic review by Bruck and Melnyk (2004) reported mixed results, but concluded language and creativity to be fairly consistently related to IS. Hritz et al (2015) also reviewed literature with the purpose of highlighting aspects to consider when interviewing a child. Whilst this review was not conducted systematically, nor were individual study characteristics formally rated for quality before conclusions drawn, they also acknowledge the inconsistent findings that exist across published studies. Hritz et al (2015) reviewed research concerning the influence of memory, executive functioning, distractibility, attention and creativity on children's IS with some studies revealing significant results, and others non-significant results or significant results in the non-predicted direction. However, the authors report that the majority of studies reviewed support an inverse relationship between a child's language skills and their susceptibility to suggestion and as such conclude, in agreement with Bruck and Melnyk (2004), language ability to be a complex, multifaceted factor affecting IS. In fact, so convinced are these authors about findings relating to language ability, they propose that language ability should be considered by interviewers independently of IQ and other measures of cognitive functioning.

Although research alludes to the importance of certain cognitive abilities and IS, the research involving people with an ID is uncertain. For this reason, an exploration of existing findings from research conducted with people with an ID is indicated. Indeed, research carried out amongst people with an ID may prove useful in furthering the understanding of factors that contribute to IS and therefore supporting or extending Gudjonsson and Clark's (1986) model of IS. Such clarifications also have the potential for exploring trans-population indicators for susceptibility to suggestion.

This review considers whether heterogeneity in results from research conducted amongst people with an ID may be better explained by individual differences in the various cognitive domains rather than the overall IQ score. For example, individuals could have the same IQ score, but vary in working memory ability. If indeed working memory moderates the relationship between IQ and IS, differences in IS (as measured

by the GSS) may be explained by examining working memory; however, the effect is masked if a unitary IQ score is used. In other words, the potential effects of single cognitive variables are hidden behind a cumulative score (IQ) therefore exploring the influence of specific cognitive variables on IS is indicated.

Aim of the current review

This systematic review evaluates literature examining the relationship between cognitive variables and the GSS in samples of people with an ID.

Method

Search strategy

Searches were completed on 22nd January 2017. Articles were identified using the following search terms: learning disabilit* or intellectual disabilit* or mental* retard* or mental* handicap* or developmental* disab* or cognitive disab* or intellectual* impair* AND gudjonsson suggestibility scale* or GSS*.

Databases searched were Pubmed/Medline, AMED, CAB abstracts, PsychArticles full text, EMBASE, EMBASE classic, Global Health, Epub ahead of print and other non-indexed citations, PsychArticles, Web of Science, Scopus, JSTOR, Westlaw, Lexis, and ProQuest. Additional articles were identified following examination of reference lists from primary search results to ensure that, where possible, all pertinent studies were included. Studies were screened based on the criteria presented in Table 1.

Table 1. Eligibility criteria for study selection

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> • Original empirical research • Full text in English language • Published from 1980 onwards • IQ scores of participants ≤ 80 	<ul style="list-style-type: none"> • Adapted versions of the GSS • Single case studies • Letters, editorials, commentaries, reviews,

• Age ≥ 16 yrs	meetings,	or	conference
• Use of GSS 1 and/or 2 within study	abstracts		

Data extraction

Where available, the following data were extracted from each included article: sample characteristics (sample size, age, gender, and recruitment source), IQ scores (range, mean, standard deviation), IQ measure, cognitive variables e.g. memory (and measures for these), and findings relating to cognitive variable/s. Authors for seven of the nine studies included were contacted to request further data regarding cognitive variables from their studies. Only one author responded, confirming that the data in their study had been disposed of.

Quality assessment

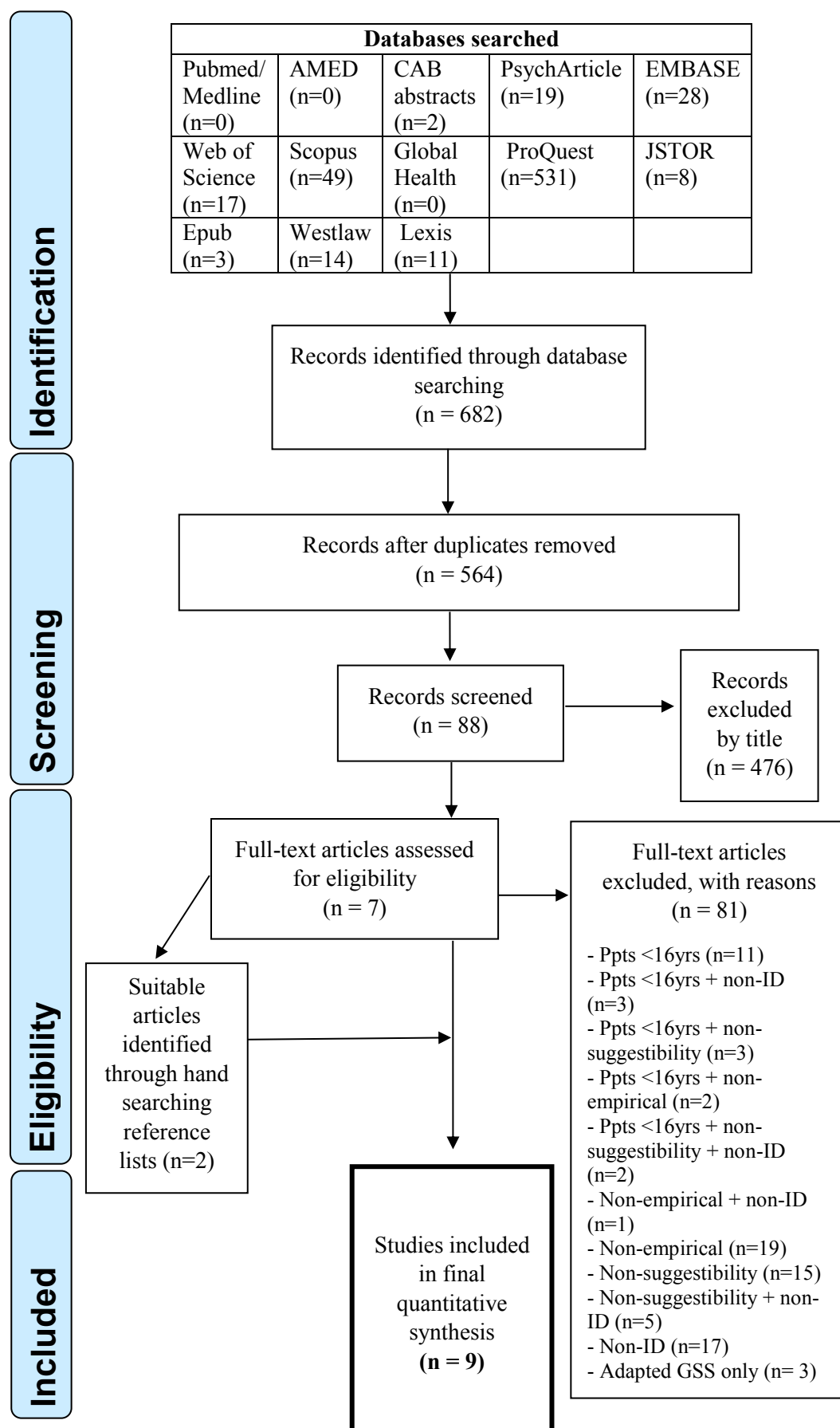
As most published quality criteria checklists relate to randomised controlled trials and intervention studies, which this systematic review does not contain, new quality criteria were developed in consultation with several sources. These included quality criteria from existing systematic reviews relating to suggestibility (Hooper, Chou & Browne, 2016; Taylor, 2011), as well as published checklists including COSMIN checklist (Terwee et al., 2012), CONSORT checklist (Schulz et al 2010), SIGN methodology checklists (SIGN, 2012) and CASP critical appraisal checklists (Critical Appraisal Skills Programme, 2017). Fourteen quality criteria were developed (see Appendix B) and ratings were assigned depending on whether a study did not meet (0 points), partially met (1 point) or fully met (2 points) the specified quality criteria. Studies that had total scores above 20 were deemed to be high quality, with scores 10-19 indicating acceptable quality, and those with scores 0-9 deemed to be low quality. Quality assessment was carried out on all the included studies independently by the researcher. A random sample of articles were independently rated by another reviewer (a second year trainee clinical psychologist from a university different to the primary researcher). This was done to increase the validity of the quality ratings. Agreement was measured using Cohen's kappa coefficient (McHugh, 2012).

Results

This section of the review will present a summary of the final studies and their findings. Due to variation in methods and measures it was not possible to combine study outcomes directly in the form of a meta-analysis. Hence, critical appraisal of the identified studies will be narrative in format, and will be structured around the cognitive variables each of the included studies investigated, and the pre-determined quality criteria.

The process of identifying studies for inclusion is presented in Figure 1. Electronic database searches yielded 682 results, with 564 remaining following the exclusion of duplicates. The first screening, via titles only, resulted in the exclusion of a further 476 references, with the second screening, involving review of abstracts, excluding a further 81 references (see Appendix C). It was at this point that reference lists of remaining articles were hand searched, leading to the identification of a further two articles for inclusion. A final total of nine studies were identified.

Figure 1. Flowchart of study identification



Included studies

Table 2. Study summaries

	Authors and year of study	Relevant sample	IQ measure	FSIQ scores	Cognitive variables (+ measures)	Findings re cognitive variable	Overall quality rating
1	Cardone & Dent (1996)	N=60 (32 male, 28 female) adults from a 'special day centre'. Age range 24-56 (mean= 36.8; SD= 9.11)	WAIS-R	53-74 (mean= 59.93; SD= 5.94). Pro-rated from 8 subtests.	'Free recall' score based on composite score from completeness of recall from 'immediate recall' and 'delayed recall' scores (as measured by GSS)	<ul style="list-style-type: none"> Relationship between recall performance and rest of the original GSS <i>not reported</i>. (Author did not respond to request for access to data). 	Acceptable
2	Clare & Gudjonsson (1993)	Group 1 (with an ID), N= 20 (15 men, 5 women) Recruited from special day centres and/or supported residential placements.	WAIS-R	57-75 (mean= 65; SD= 5.3) (Group 1). Pro-rated from 8 subtests.	'Immediate recall' and 'delayed recall' (as measured by GSS)	<ul style="list-style-type: none"> Relationship between recall performance and rest of the original GSS <i>not reported</i> (lead author contacted and confirmed data had been destroyed) Immediate recall and delayed recall were significantly lower in those with an ID, than those without. 	Acceptable

	Authors and year of study	Relevant sample	IQ measure	FSIQ scores	Cognitive variables (+ measures)	Findings re cognitive variable	Overall quality rating
		mental health facility. No ages reported for either group.				<ul style="list-style-type: none"> All scores except shift were significantly different between ID and non-ID groups. 	
3	Gudjonsson, Murphy, & Clare (2000)	N=49 (31 men, 18 women) Recruited from private residential homes Age range 24-70 (mean= 37; SD= 12.6)	WAIS-R	45-82 (mean= 53.8; SD= 10.2). All 11 subtests administered to 76% of participants. 24% excluded from assessment due to severe verbal communication problems.	'Immediate recall' and 'delayed recall' (as measured by GSS)	<ul style="list-style-type: none"> Total suggestibility and yield 2 scores correlated with immediate and delayed recall. IQ correlated with immediate and delayed recall scores, and yield 2 scores. 	Acceptable
4	Gudjonsson & Henry (2003)	N=221 (178 males, 43 females) Recruited from referrals to author for forensic assessment report. Mean age 30.6 (SD=1.7)	WAIS-R	Mild ID group: mean= 67.4; SD= 5.7) Moderate ID group: mean= 49.6; SD= 3.0). Number of administered subtests was not specified.	'Immediate recall' and 'delayed recall' (as measured by GSS)	<ul style="list-style-type: none"> Scores merged with normal IQ adults so conclusions specific to population of people with an ID are not possible (Lead author did not respond to request for access to data). For those with a mild/moderate ID, verbal memory scores (GSS recall) consistently low, but 	Acceptable

	Authors and year of study	Relevant sample	IQ measure	FSIQ scores	Cognitive variables (+ measures)	Findings re cognitive variable	Overall quality rating
						<p>more of a range with other GSS scores.</p> <p>(Author did not respond to request for access to data).</p>	
5	O'Connell, Garmoe & Goldstein (2005)	<p>N=60 (40 men, 20 women) across all groups.</p> <p>Group 1 (the only group that used original format of GSS) N=19.</p> <p>Recruited from agencies supporting those with 'developmental disabilities'.</p> <p>Whole sample age range 25-45</p>	ID diagnoses confirmed by reviewing participants' records from agency referring	Group 1 mean= 60.5; SD= 5.6	'Immediate recall' and 'delayed recall' (as measured by GSS)	<ul style="list-style-type: none"> • IQ negatively correlated with yield 1 scores. • Immediate verbal memory not significantly related to yield 1. 	Low

	Authors and year of study	Relevant sample	IQ measure	FSIQ scores	Cognitive variables (+ measures)	Findings re cognitive variable	Overall quality rating
6	Sharrock & Gudjonsson (1993)	N= 108 (with + without ID) N= 26 (IQ<70) Referred by solicitors for legal assessments. Gender and ages for those with an ID not reported.	WAIS-R	IQ range for whole group 55-126 (mean = 79; SD= 14) 26 participants with IQ<70 identified, IQ specific IQ scores not reported. Number of administered subtests was not specified.	Memory as measured by GSS explored but across all participants.	<ul style="list-style-type: none"> 14 out of 26 participants do not score significantly higher on shift compared to those with IQ>70. No other results specific to those with IQ<70. <p>(Author did not respond to request for access to data).</p>	Acceptable

	Authors and year of study	Relevant sample	IQ measure	FSIQ scores	Cognitive variables (+ measures)	Findings re cognitive variable	Overall quality rating
7	Sondena, Rasmussen, Palmstierna, & Nottestad, (2010)	N= 133 (total subjects with + without ID) N= 14 (IQ<70)	WASI	Whole group mean IQ= 91.9; SD= 15.6. For those with IQ<70 mean= 64.1; SD= 4.2	Memory as measured by GSS explored but across all participants. Hayes Screening (HASI) Ability Index	<ul style="list-style-type: none"> Not reported for those with IQ<70 (lead author did not respond to request for access to data). VIQ, PIQ and FSIQ negatively correlated with GSS subtests, with stronger correlations reported for VIQ (authors do not report whether statistically significantly stronger than other scores). No results pertaining to HASI reported 	Acceptable
8	White & Willner (2005)	N=40 (20 male, 20 female) Participants recruited from 2 day centres for those with an ID.	WASI	Total sample range 51-70, mean= 57 but comprised of participants from 2 centres: Centre 1: mean IQ= 55.4; SD= 1.2, mean VIQ= 56.6;	British Vocabulary (BPVS) Picture Scale 'Immediate recall' and 'delayed recall' (as measured by GSS)	<ul style="list-style-type: none"> No results pertaining to BPVS reported Relationship between recall performance and rest of the original GSS not reported 	Acceptable

	Authors and year of study	Relevant sample	IQ measure	FSIQ scores	Cognitive variables (+ measures)	Findings re cognitive variable	Overall quality rating
				<p>SD= 1.0, mean PIQ= 60.1; SD= 1.5</p> <p>Centre 2: mean IQ= 57.7, SD= 1.2, mean VIQ= 58.6; SD= 1.1, mean PIQ= 62.6; SD= 1.6</p>		<p>(Author did not respond to request for access to data).</p>	
9	Willner (2008)	N=24 recruited from day centres for those with an ID.	WASI	<p>Comprised of participants across 3 groups:</p> <p>Group 1: mean IQ: 57.8, SD 1.9, VIQ: 58.3, SD 2.2, PIQ: 63.0, SD 1.9</p> <p>Group 2: mean IQ: 58.0, SD 2.1, VIQ: 57.8, SD 1.3, PIQ: 63.9, SD 3.4</p> <p>Group 3: mean IQ: 54.5, SD 1.4, VIQ: 56.4, SD 1.1, PIQ: 59.0, SD 1.6</p>	<p>British Vocabulary (BPVS)</p> <p>Picture Scale</p> <p>'Immediate recall' (as measured by the GSS)</p>	<ul style="list-style-type: none"> No results pertaining to BPVS reported Relationship between recall performance and rest of the original GSS not reported. <p>(Author did not respond to request for access to data).</p>	Acceptable

Synthesis of results from studies

The exploration of cognitive variables with GSS scores was not the primary focus for any of the included articles. Instead, these data were reported as a supplementary analysis in each study. The variety of cognitive variables reported within the included studies was limited to three distinguishable domains (memory, verbal and non-verbal [performance] intelligence, and language), which will be summarised below.

Critical appraisal of the studies

Quality ratings

Four studies were randomly selected to be reviewed by the independent reviewer. Together with the primary researcher's quality ratings, the ratings were subjected to a Cohen's κ to determine if there was agreement between reviewers (Laerd Statistics, 2015). According to agreement criteria by Altman (1999) there was 'very good' agreement between the reviewers, $\kappa = .836$, 95% CI [.713, .959], $p < .001$. Any differences in ratings were discussed between reviewers until a single rating was agreed upon.

The overall quality scores assigned to each paper can be seen in Table 2. One study achieved a 'low quality' rating (O'Connell, Garmoe & Goldstein, 2005), whilst the rest achieved 'acceptable quality' ratings. No studies achieved 'high quality' ratings which further highlights the difficulty in drawing conclusions from existing research. Full quality ratings per quality criteria for each study can be seen in Appendix D. The following section will more broadly discuss some of the main methodological issues identified when appraising each article.

Sample characteristics

Both inclusion and exclusion criteria are stated in only one out of the nine studies (O'Connell, Garmoe & Goldstein, 2005), with Sondenaa, Rasmussen, Palmstierna and Nottestad, (2010) only partially reporting exclusion criteria.

Sharrock and Gudjonsson (1993) and Sondenaa, Rasmussen, Palmstierna and Nottestad (2010) did not report age or gender composition of their sample. Whilst research appears to be inconsistent in determining whether gender differences exist in adults in relation to IS (Abbasi & Hong, 2012), there is more certainty regarding the influence of age in adults (Gudjonsson, 1984), even after memory has been controlled for in the elderly (Dukala and Polczyk, 2014). There was some variability in terms of gender balance and age ranges, particularly for Clare and Gudjonsson (1993) and Gudjonsson and Henry (2003) but it is unclear what effect this may have on their findings.

Participants were recruited from a range of sources. Five studies recruited from special community/day centres, two from forensic establishments (e.g. prison), one from residential agencies and one from the study author's private forensic cases (defendant, victim or alleged witness). A bias towards forensic populations is noted, but the degree of influence this has on reported findings is uncertain. One of the studies in this review explores the link between previous convictions and IS and claim that previous interrogative experience may reduce suggestibility. If this is the case, caution should be exercised when generalising results from forensic ID populations to the wider ID population.

None of the studies included in this review report attrition or rates at which eligible individuals declined to participate, therefore it is unclear whether this is due to a lack of reporting, or difficulties in this area.

Confirmation of intellectual disability

For a diagnosis of an ID to be made, the British Psychological Society (BPS) state that individuals must demonstrate significant impairment of intellectual functioning,

significant impairment of adaptive behaviour, and onset of impairment before adulthood. No studies included in this review independently measured both intellectual and adaptive functioning, nor commented on confirmation of impairment onset prior to age 18 (BPS, 2015).

Also in their guidance document for the assessment of ID, the BPS state that the optimal measure of intellectual functioning is provided by the most current version of the Wechsler Adult Intelligence Scale (WAIS; BPS, 2015). Crawford, Allan, and Jack, (1992) report that whilst the use of all 11 subtests of the Wechsler Adult Intelligence Scale-Revised (WAIS-R, Wechsler, 1986) is optimal for diagnostic purposes, versions containing 7 subtests or more do not compromise the reliability or validity of IQ scores enough to render them unsuitable for research or screening purposes. It was therefore not too concerning that Cardone and Dent (1996) and Clare and Gudjonsson (1993) used only 8 out of the optimal 11 subtests of the WAIS-R. It was noted that Gudjonsson, Murphy and Clare (2000) and Gudjonsson and Henry (2003) also used the WAIS-R for measurement of their participants' IQ despite this measure not being the most current Wechsler Adult Intelligence Test at the time of publication of each of their respective studies, although it is acknowledged that, at that time of data collection, this may not have been available.

O'Connell, Garmoe and Goldstein (2005) did not conduct formal assessments of IQ, as part of their study protocol, instead confirming participant's ID status by reviewing case files from referring agencies. Finally, three studies (Willner & White, 2003; Willner, 2008; Sondenaa, Rasmussen, Palmstierna & Nottestad, 2010) utilised the Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999) to ascertain participants level of intellectual functioning. Whilst the 'gold standard' is the administration of all subtests of the most current WAIS, in certain circumstances administration of the most current version of the WASI is acceptable but not to be relied on for diagnostic purposes (BPS, 2015).

Full Scale IQ (FSIQ)

The FSIQ is a single score quantification of global cognitive capacity (Wechsler, 1999). A FSIQ score is typically derived from an individual's performance on standardised measures of verbal comprehension, perceptual reasoning, processing speed and working memory. Three out of the nine studies in the present review report on relationships between FSIQ and GSS scores for participants with an ID. Sondenaa, Rasmussen, Palmstierna and Nottestad (2010) found that FSIQ scores negatively correlated with all scores of the GSS, meaning that as FSIQ scores increased in their sample, individuals tended to yield less to leading questions, and shift their answers less. Gudjonsson, Murphy and Clare (2000) found this also to be the case, but only for immediate and delayed recall scores and 'yield 2' scores on the GSS. The only correlation (negative) that O'Connell, Garmoe and Goldstein (2005) found between FSIQ and GSS scores were for 'yield 1' scores. It is therefore difficult to make reliable conclusions regarding the relationship between FSIQ and GSS scores. It is unfortunate that the other six studies do not report these analyses, as this data may have provided support or refutation of claims made by previous researchers that IQ negatively correlates with all scores on the GSS.

Memory

The term 'memory' captures a diverse set of cognitive capacities by which individuals retain information and reconstruct past experiences, usually for present purposes. None of the studies in the present review acknowledge (or differentiate) types of memory other than verbal, nor do they use a standardised, reliable and valid measure of memory ability. Instead all included studies reported measurement of memory in the form of recall ability (delayed and immediate) as measured by the GSS. In his creation of the GSS, Gudjonsson (1984) described how the recall aspect of the scales could be scored in a manner similar to the Wechsler Memory Scales (WMS; Wechsler, 1945); however, Gudjonsson (1984) did not report how closely the two correlate with one another. Therefore, it is not known how representative of general memory abilities the GSS immediate and delayed recall scores are, despite most studies in this review appearing to draw conclusions based on the assumption that the GSS recall scores are indeed representative of memory abilities.

Two studies report significant relationships between recall ability (as measured by the GSS) and other GSS scores. Gudjonsson, Murphy and Clare (2000) found that it was only yield 2 score that significantly negatively correlated with both immediate and delayed recall scores on the GSS, both with coefficients indicating weak and moderate correlations respectively (Field, 2013). O'Connell, Garmoe and Goldstein (2005) found that immediate and delayed recall ability were not significantly associated with yield 1 scores on the GSS which is contrary to what other studies have hypothesised about yield 1 being more related to cognitive processes than yield 2 or shift scores. The latter authors do not report any other associations, significant or otherwise.

One study (Cardone & Dent, 1996) created a composite score for immediate and delayed recall ability and termed this 'free recall' ability. However, they did not report relationships between recall performance and GSS scores. Two other studies (Sharrock & Gudjonsson, 1993; Sondena, Rasmussen, Palmstierna & Nottestad, 2010) explored the association between memory (as measured by the GSS) and other scores on the GSS; however, this was done across all participants (those with and without an ID) so no inferences can be made for people with an ID specifically. Four studies (Cardone & Dent, 1996; Clare & Gudjonsson, 1993; Willner & White, 2003; Willner, 2008) did not report relationships between recall ability and performance on any of the GSS.

Three articles (Gudjonsson, Murphy & Clare, 2000; Gudjonsson & Henry, 2003; O'Connell, Garmoe & Goldstein, 2005) acknowledged floor effects for participants' recall abilities on the GSS. O'Connell, Garmoe and Goldstein (2005) and Gudjonsson, Murphy and Clare (2000) provided calculations regarding this, with the former authors reporting performances at or below the 9th percentile, and the latter authors reporting that 28% of participants were unable to recall any detail at immediate recall, reducing to 48% at delayed recall.

Verbal and Performance Intelligence Quotients

Whilst most studies explored the association between IQ and GSS scores, one study (Sondena, Rasmussen, Palmstierna, & Nottestad, 2010) reported separate scores for verbal (VIQ) and performance (PIQ) abilities extracted from the Weschler Abbreviated Scale of Intelligence (WASI; Weschler, 1999). In their study, they found that both VIQ and PIQ negatively correlated with the GSS, but VIQ slightly more so, alluding to the possibility that verbal ability (e.g. language based problem solving) plays a differential role to performance IQ in relation to IS.

Language Ability

Two studies (White & Willner, 2003; Willner, 2008) used the British Picture Vocabulary Scale (BPVS; Dunn & Dunn, 1982), which is a measure of receptive language assessment for vocabulary ability for children ages 3-16 years. Unfortunately scores on the BPVS were not reported in relation to the GSS so no inferences regarding receptive language ability/vocabulary can be made. It was also noted that for one study (Sondena, Rasmussen, Palmstierna, & Nottestad, 2010), participants completed the Hayes Ability Screening Index (HASI; Hayes, 2000), which is a tool that screens for ID and some speech, language and communication needs. However, the authors did not report data from this measure in their study, stating that they were reported elsewhere. The author of the present review was not successful in identifying where the data for the HASI was published.

Interrogative Suggestibility measure

Administration of the GSS appears to have been carried out largely consistently within each study. Seven out of the nine studies in this review utilised the GSS2, whilst the other two studies used the GSS1. Whilst no significant differences have been found between measures (Gudjonsson, 1987), it was claimed in the study by Clare and Gudjonsson (1993) that a study was in preparation (Gudjonsson, 1993) that found the GSS2 to be better suited for use amongst people with an ID due to the questions being less complex to understand. However, the 'in preparation' article could not be found by the author of this review.

Discussion

Perhaps because the relationship between cognitive abilities and performance on the GSS was not the primary focus of all articles, it was not always the case that all relationships were reported. In those that did report such relationships, there are some findings that suggest memory (as measured by the GSS) relates to scores on the GSS. However, because no standardised measure of memory is used in any of the studies included, inferences based on these findings are limited. Furthermore, how representative immediate and delayed recall ability (as measured by the GSS) is to the breadth and complexity of memory functioning is unclear.

Data from the BPVS is not reported therefore conclusions regarding the influence of language ability on IS for people with an ID cannot be made. Furthermore, due to the lack of availability of norms for those over the age of 16 with an ID, any inferences would have to be tentative.

Given the findings from previous reviews that explore the cognitive variables implicated in IS amongst the child and adolescent population, it seems that people with an ID have been somewhat neglected from similar explorations. It may be that the lack of research in this area reflects the concerns of clinicians and researchers regarding the GSS's suitability for use with the population of people with an ID. It is also possible that a lack of research in this area relates to a possible assumption by some that all individuals with an ID are highly suggestible. This may be a consequence of diagnostic overshadowing; the concept whereby any difficulties individuals with an ID present with are attributed to the fact they have a diagnosis of an ID rather than other individual differences (Emerson et al., 2012). It is not uncommon for people with an ID to be considered as a homogenous group (Kebbel & Hatton, 1999). As well as being incorrect, this is likely to hinder much needed theoretical advancement.

Each of these discussion points highlights the need for increased inclusion of people with an ID in research more generally, particularly as clinicians and researchers may have limited information regarding variability that may help contribute to the

theoretical understanding of IS (and individual differences). If indeed is established that certain cognitive abilities increase susceptibility to IS, there may be trans-population implications, for example to those with other forms of cognitive impairment for example dementia, and acquired brain injury.

Implications and future research

Findings from other populations may highlight the usefulness of further exploring this topic with the exploration of cognitive variables being the primary objective. Ongoing suggestibility research should include valid and reliable measures of specific cognitive variables, instead of a general measure of cognitive ability such as FSIQ. Pooling results from all populations to explore the relationship between certain variables, therefore striving to identify trans-population indicators for susceptibility to suggestion.

Given the apparent complexity of the IS construct, a systematic exploration of not only single cognitive variables, but combinations of variables that are likely linked IS is indicated. In addition, whether other internal variables (such as anxiety [Gudjonsson, 1988]) mediate the relationship between cognitive abilities and IS would be important, particularly for applied considerations.

Whilst most limitations to adaptive functioning are due to reduced intellectual functioning, it cannot be assumed that everyone with IQ <70 will have similar levels of global impairment. In fact, IQ and adaptive functioning are not found to be highly correlated (Sparrow, Chichetti & Balla, 2005). It would be interesting to explore how adaptive functioning ability related to IS, particularly as none of the studies included within this review assess adaptive functioning nor explore this in relation to GSS performance. One might hypothesise that better adaptive functioning is associated with increased resistance to IS, but further research is required.

It was also noted within the studies included in this review that many people with an ID perform very poorly on the recall aspect of the GSS, highlighting a potential floor

effect for this measure. Even if it is confirmed that recall ability (immediate and delayed) on the GSS is representative of memory ability, a measure that provides a wider range of scores would be preferable to use for future comparisons.

If indeed it is identified from further quality research that an individual's susceptibility to IS can be predicted by their performance on certain cognitive measures, the quandary of whether it is practical to routinely assess every individual is raised. It may only be in situations when suspicions arise that a comprehensive assessment of IS is indicated. Alternatively, the development of a screening assessment would be beneficial to help establish whether a more comprehensive assessment is indicated or not.

Whilst this review focused on IS as measured by the GSS, there is the potential for widening the search to include other measures of suggestibility; however, this is likely to involve deviating from theoretical territory outlined by Gudjonsson and Clark's model of IS (1986). There is also the potential for expanding the inclusion criteria to capture modified versions of the GSS. It may be that modifications of the GSS lead to a score that is more representative of the 'true' concept of IS, however there is also the risk that the opposite effect is achieved. It is for the latter reason that this review chose to focus on a purist form of the measure.

Strengths and limitations of this review

A relative strength of this review are the broad search terms that were used. Instead of including the term 'cognitive' or a variant of this, the search was kept wide in that it looked for any studies that used the GSS with people with an ID therefore including studies where exploration of cognitive variables was supplementary to the primary research question.

There are a number of limitations to this review. As with any systematic review that yields limited number of studies in a particular area, there is a chance that this instead reflects a flaw in the search process. For example, it may be that other grey literature

exists, but as only one grey literature database was included some existing research may not have been identified. The lack of research may also represent a publication bias, in that studies may exist that have failed to find significant relationships with any cognitive variables, however these are not included in this review as they were not published (Dwan, Gamble, Williamson, & Kirkham (2013)).

Clinical Implications

It is concluded that despite some claims made regarding the role of certain cognitive variables (e.g. memory) in IS in other populations, there is a scarcity of appropriate research in this area to substantiate these claims within the population of people with an ID. Based on findings of this review, it is suggested that clinicians remain cautious about assuming a link between cognitive variables and IS amongst the population of people with an ID. At present, there is a lack of reliable data on which to base substantive recommendations for clinical practice at this time. Hence, further research in this field is imperative.

Conflict of interest declaration

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Systematic Review References

- Abbasi, N. ul H., & Hong, L. (2012). Assessing Interrogative Suggestibility, an adaptation of Gudjonsson Suggestibility Scale (GSS): Gender Difference in witnessing an event. *International Journal of Social Science & Education*, 3(1), 159–165.
- Altman, D. G. (1999). *Practical statistics for medical research*. New York, NY: Chapman & Hall/CRC Press
- Bain, S. & Baxter, J. S. (2000). Interrogative suggestibility: The role of interviewer behaviour. *Legal and Criminological Psychology*, 5, 123–133.
- Baxter, J. S. (1990). The suggestibility of child witnesses: A review. *Applied Cognitive Psychology*, 4(5), 393-407.
- Beail, N. (2002). Interrogative Suggestibility, Memory and Intellectual Disability. *Journal of Applied Research in Intellectual Disabilities*. 15. 129 – 137.
- Blagrove, M. (1996). Effects of length of sleep deprivation on interrogative suggestibility. *Journal of Experimental Psychology: Applied*, 2(1), 48–59.
- British Psychological Society. (2015). Guidance on the assessment and diagnosis of intellectual disabilities in adulthood, 1–36.
- Bruck, M., & Melnyk, L. (2004). Individual differences in children's suggestibility: A review and synthesis. *Applied Cognitive Psychology*, 18(8), 947–996.
- Cardone, D., & Dent, H. (1996). Memory and interrogative suggestibility: The effects of modality of information presentation and retrieval conditions upon the suggestibility scores of people with learning disabilities. *Legal and Criminological Psychology*, 1(2), 165-177.

Clare, I. C. H., & Gudjonsson, G. H. (1993). Interrogative suggestibility, confabulation, and acquiescence in people with mild learning disabilities (mental handicap): Implications for reliability during police interrogations. *British Journal of Clinical Psychology*, 32(3), 295–301.

Crawford, J. R., Allan, K. M., & Jack, A. M. (1992). Short forms of the UK WAIS-R: Regression equations and their predictive validity in a general population sample. *British Journal of Clinical Psychology*, 31(2), 191–202.

Critical Appraisal Skills Programme (2017). CASP Cohort Study Checklist. Retrieved from: http://media.wix.com/ugd/dded87_5ad0ece77a3f4fc9bcd3665a7d1fa91f.pdf

Dukala, K., & Polczyk, R. (2014). Age and interviewer behavior as predictors of interrogative suggestibility. *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, 69(3), 348–355.

Dunn, L. M., & Dunn, L. M. (1982). *The British Picture Vocabulary Scale*. Windsor, England: NFER-Nelson.

Drake, K. E. (2010). Interrogative suggestibility: Life adversity, neuroticism, and compliance. *Personality and Individual Differences*, 48, 493–498.

Dwan, K., Gamble, C., Williamson, P. R., & Kirkham, J. J. (2013). Systematic review of the empirical evidence of study publication bias and outcome reporting bias—an updated review. *PloS one*, 8(7), 66-84

Emerson, E., Hatton, C., Dickson, K., Gone, R., Caine, A., & Bromley, J. (2012). *Clinical Psychology and People with Intellectual Disabilities – 2nd Edition*. Chichester: Wiley & Sons

Field, A. P. (2013). *Discovering statistics using IBM SPSS Statistics: And sex and drugs and rosk ‘n’ roll* (4th ed.). London: Sage.

Gudjonsson, G. H., Murphy, G. H., & Clare, I. C. (2000). Assessing the capacity of people with intellectual disabilities to be witnesses in court. *Psychological Medicine*, 30(02), 307-314.

Gudjonsson, G. H. & Clark, N. K. (1986). Suggestibility in Police Interrogation: A Social Psychological Model. *Social Behaviour*, 1, 83-104.

Gudjonsson, G. H. (1983). Suggestibility, intelligence, memory recall and personality: An experimental study. *British Journal of Psychiatry*, 142(1), 35–37.

Gudjonsson, G. H., & Henry, L. (2003). Child and adult witnesses with intellectual disability: The importance of suggestibility. *Legal and Criminological Psychology*, 8(2), 241-252.

Gudjonsson, G. H. (1984). A new scale of interrogative suggestibility. *Personality and individual differences*, 5(3), 303-314.

Gudjonsson, G. H. (1988). Interrogative suggestibility: Its relationship with assertiveness, social-evaluative anxiety, state anxiety and method of coping. *British Journal of Clinical Psychology*, 27(2), 159-166.

Gudjonsson, G. H. (1987). A parallel form of the Gudjonsson Suggestibility Scale. *British Journal of Clinical Psychology*, 26, 215 - 221.

Hayes, S. C. (2000). Hayes Ability Screening Index (HASI). HASI Publications: Australia.

Henry, L. A., & Gudjonsson, G. H. (2007). Individual and developmental differences in eyewitness recall and suggestibility in children with intellectual disabilities. *Applied Cognitive Psychology*, 21(3), 361-381.

Hooper, V. R., Chou, S., & Browne, K. D. (2016). A systematic review on the relationship between self-esteem and interrogative suggestibility. *Journal of Forensic Psychiatry & Psychology*, 27(6), 761–785

Howells, K. & Ward, M. (1994). Intellectual impairment, memory impairment, suggestibility and voir dire proceedings: a case study. *Medicine, Science & the Law*, 34, 176 – 180.

Hritz, A. C., Royer, C. E., Helm, R. K., Burd, K. A., Ojeda, K., & Ceci, S. J. (2015). Children's suggestibility research: Things to know before interviewing a child. *Anuario de Psicología Jurídica*, 25(1), 3–12.

Kebbell, M. R., & Hatton, C. (1999). People with mental retardation as witnesses in court: A review. *Mental retardation*, 37(3), 179-187.

Laerd Statistics (2015). Cohen's kappa using SPSS Statistics. *Statistical tutorials and software guides*. Retrieved from <https://statistics.laerd.com/>

McGroarty, A. & Thomson, H. (2012). Negative emotional states, life adversity, and interrogative suggestibility. *Legal and Criminological Psychology*, 1-13

McHugh, M. (2012). Interrater reliability: the kappa statistic. *Biochemia Medica*, 22(3), 276–282.

Milne, R., Clare, I. C. H., & Bull, R. (2002). Interrogative suggestibility among witnesses with mild intellectual disabilities: The use of an adaptation of the GSS. *Journal of Applied Research in Intellectual Disabilities*. 15. 8-17.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 6(7).

O'Connell, M. J., Garmoe, W., & Goldstein, N. E. S. (2005). Miranda comprehension in adults with mental retardation and the effects of feedback style on suggestibility. *Law and Human Behavior*, 29(3), 359.

Polczyk, R. (2005). Interrogative suggestibility: Cross-cultural stability of psychometric and correlational properties of the Gudjonsson Suggestibility Scales. *Personality and Individual Differences*, 38(1), 177–186.

Ridley, A. M., & Gudjonsson, G. H. (2012). Suggestibility and Individual Differences. In *Suggestibility in Legal Contexts* (pp. 85–106). John Wiley & Sons, Ltd.

Schulz, K. F., Altman, D. G., Moher, D., Barbour, V., Berlin, J. A., Boutron, I., Guyatt, G. (2010). CONSORT 2010 statement: Updated guidelines for reporting parallel group randomised trials (Chinese version). *Journal of Chinese Integrative Medicine*, 8(7).

Scottish Government (2013). Keys To Life: Improving Quality of Life for People with Learning Disabilities. Retrieved from: <http://keystolife.info/wp-content/uploads/2014/05/the-keys-to-life-full-version.pdf>

Sharrock, R., & Gudjonsson, G. H. (1993). Intelligence, previous convictions and interrogative suggestibility: A path analysis of alleged false-confession cases. *British Journal of Clinical Psychology*, 32(2), 169-175.

SIGN (2012) Scottish Intercollegiate Guidelines Network – Methodology Checklists. Retrieved from: <http://www.sign.ac.uk/methodology/checklists.html>.

SØNDENAA, E., Rasmussen, K., Palmstierna, T., & NØTTESTAD, J. A. (2010). The usefulness of assessing suggestibility and compliance in prisoners with unidentified intellectual disabilities. *Scandinavian journal of psychology*, 51(5), 434-438.

Sparrow, S.S., Chichetti, D.V. & Balla, D.A. (2005). Vineland Adaptive Behaviour Scales (2nd ed.). Oxford: Pearson Clinical Assessment.

Taylor, I. (2011). *Fitness to plead and stand trial: The impact of mil intellectual disability*. (Unpublished doctoral thesis). University College London, UK.

Terwee, C. B., Mokkink, L. B., Knol, D. L., Ostelo, R. W. J. G., Bouter, L. M., & De Vet, H. C. W. (2012). Rating the methodological quality in systematic reviews of studies on measurement properties: A scoring system for the COSMIN checklist. *Quality of Life Research*, 21(4), 651–657.

Weschler, D. (1999) *Weschler Abbreviated Scale of Intelligence Manual*, San Antonio, TX: Harcourt Brace & Company.

Wechsler (1986). *WAIS-R Manual*. New York: Psychological corporation.

Wechsler, D. (1945). A standardized memory scale for clinical use. *Journal of Psychology*, 19, 87–95

White, R. & Willner, P. (2005). Suggestibility and salience in people with intellectual disabilities: An experimental critique of the Gudjonsson Suggestibility Scale. *The Journal of Forensic Psychiatry & Psychology*, 16(4). 638 – 650.

Willner, P. (2011). Assessment of capacity to participate in court proceedings: a selective critique and some recommendations. *Psychology, Crime & Law*, 17(2), 117-131.

Willner, P. (2008). Clarification of the memory artefact in the assessment of suggestibility. *Journal of Intellectual Disability Research*, 52(4), 318-326.

Chapter 4: Empirical Study

**The measurement of suggestibility in adults with intellectual disabilities:
Adaptation of the Gudjonsson Suggestibility Scales and an exploration of the
influence of cognitive variables.**

Written in accordance with author guidelines for:
Journal of Applied Research in Intellectual Disability (JARID; see Appendix A).

Abbreviated title for running head:
Adaptation of the GSS

Keywords:

Suggestibility

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Cognitive

Individual differences

Neuropsychology

Empirical Study Abstract

Background: The use of the Gudjonsson Suggestibility Scales (GSS) for assessment of interrogative suggestibility (IS) for people with an intellectual disability (ID) has been criticised for relying on verbal working memory ability which may be problematic for those with an ID. Existing research has made various adaptations to improve the utility of the GSS with people with an ID. This study aims to combine past adaptations to explore the effect on GSS performance.

Method: 40 adults with an ID completed an adapted version of the GSS along with measures of IQ, verbal working memory, visual memory and situational anxiety.

Results: The addition of visual information to a shortened adapted version of the GSS failed to significantly improve the performance of people with an ID on the GSS. A multiple regression analysis identified a potential association between visual memory and outcomes on the adapted GSS, but clear theoretical conclusions were difficult to draw.

Conclusions: The addition of visuals to an adapted GSS failed to improve IS scores.

Introduction

Suggestibility has been defined in many ways; however most authors allude to it being a tendency to accept and/or alter behaviour under the influence of another's suggestion (Ridley, 2012). Whilst very early literature regarding the concept of suggestibility was closely intertwined with that of hypnosis (Morgan, 1924; Orne, 1977; Ridley, 2013), later research related to event recollection. Cattell, in the late 19th century, carried out some of the earliest experimental work in this area, highlighting the effects of suggestion upon testimony (as cited in Sporer, 1982), and later Loftus and Palmer (1974) examined specifically the impact that wording has on the distortion of memory. It was not long after this that Gudjonsson (1984) acknowledged a certain type of suggestibility that arises in the context of an interrogation. As part of his model of interrogative suggestibility (IS), Gudjonsson (1984) identified two main ways that an individual's responses can be influenced during questioning: with the use of leading questions and through criticism or negative feedback. Based on this model, Gudjonsson developed the Gudjonsson Suggestibility Scales as a measure to index the degree to which an individual is susceptible to IS (GSS; Gudjonsson, 1984, 1987). In this assessment, a brief story is read aloud and the listener is asked how much they can recall of it straight afterwards. After a delay of 50 minutes, the listener is then asked what they can recall about the story before being asked a series of questions about it, some of which are leading. The listener is then told that they have made a number of errors, and the original questions are then asked again. The scales give a measure of the degree to which a person 'yields' to leading questions, and the extent to which a person will 'shift' their answers in response to the inter-personal pressure of being told that their performance is not optimal. A number of psychosocial and cognitive factors have been found to influence an individual's suggestibility on the GSS, these include; anxiety, self-esteem, adverse life events, and memory ability (Ridley & Gudjonsson, 2012).

The Gudjonsson Suggestibility Scales and Adults with Intellectual Disabilities

The GSS are used frequently as an index of suggestibility for people with an intellectual disability (ID) who come into contact with the criminal justice system,

either as alleged perpetrators or victims (Howells & Ward, 1994; Clare & Gudjonsson, 1993). As people with an ID tend to score more highly on the GSS than those without IDs, they are deemed, on this assessment, to be more suggestible than those without an ID (Everington & Fulero, 1999; Clare & Gudjonsson, 1993). However, the GSS have been criticised for their reliance on purely verbal information, particularly when most human testimony and lived experiences involve encoding of many sources of information beyond this (Beail, 2002; White & Willner, 2005).

Beail (2002) argued that the GSS are designed in such a way as to rely on semantic memory rather than autobiographical memory, therefore potentially reducing the ecological validity of the GSS. It would be expected that information pertaining to an event witnessed in person be encoded into autobiographical memory rather than semantic memory, as would be the case with the story read out as part of the GSS (Kebbell & Hatton 1999; Baddeley, Eysenck, & Anderson, 2009). Beail (2002) also noted that the questions within the GSS are more likely to elicit acquiescent responses (responding in the affirmative, regardless of question) from individuals who are firmly encouraged to answer questions on information they often have difficulty recalling in the first place (e.g. fictional events). If people with an ID are more at risk of acquiescence or guessing, particularly in the face of uncertainty (Heal & Sigelman, 1995), this would result in individuals scoring for suggestibility (as indexed by the GSS) therefore inflating their score based on uncertainty rather than true suggestibility.

Based on Beail's (2002) conclusion that it is the GSS's reliance on semantic memory rather than autobiographical memory that contributes to lower recall scores (and therefore higher suggestibility scores), White and Willner (2005) designed a study to explore this further. They compared performance on a suggestibility scale (similar to the GSS) for "real life" events that had been experienced by the individual, versus impersonal events depicted as part of a fictional story (as in the GSS). They found that IS, as measured by the scale, was higher for the impersonal content depicted as part of the fictional story, compared to actual events witnessed in person. Hence, individuals were determined to be more suggestible as a result of limitations to verbal working

memory capacity rather than as an indication that they are inherently more suggestible, by dint of their ID.

Gudjonsson and Clare (1995), and Milne, Clare and Bull (2002) found recall ability to be inversely related to suggestibility scores, implying that those with better recall ability may be less susceptible to interrogative pressure. Cardone and Dent (1996) added pictorial stimuli to some items of the GSS in order to improve memory encoding. It was hypothesised that this would reduce subsequent suggestibility scores for a group of people with an ID. They found that the addition of pictorial stimuli significantly increased immediate and delayed recall, and reduced the extent to which participants 'yielded' to leading questions; no change in the degree of 'shift' was seen, however.

An unpublished study by Bowden (1998) used video stimuli to accompany the verbal information with the objective of better replicating 'real life' visual information. However, the addition of video stimuli to story narrative did not lead to a significant improvement in story recall ability or a reduction in suggestibility scores. It was postulated that the visual information (video) may not have been present for long enough to be encoded, as such it would be reasonable to think that having a visual adaptation may only be useful if there is sufficient quantity of it, and if it is present for long enough to be encoded by the participant (as occurred for Cardone and Dent, 1996, when they used pictures).

Willner (2008) investigated whether reducing verbal memory load (by asking for recall half way through the GSS story instead of at the end) reduced suggestibility scores. Whilst he found that recall improved somewhat, there was no significant change to suggestibility scores. This could indicate that memory ability is unrelated to suggestibility as measured by the GSS, or it may be that this adaptation was not sufficient, and an impact on suggestibility scores may have been observed if he had supplemented the verbal information with visuals as per Cardone and Dent (1996).

Although it appears that the majority of research that has looked specifically at language ability has been conducted within the child population, some researchers

have reported inverse relationships between suggestibility and certain aspects of language, e.g. narrative ability, comprehension ability (Hritz et al, 2015; Bruck & Malnyk, 2004). For this reason, a reliance on verbal information may be problematic for individuals with compromised cognitive functioning. Thus, some authors have strongly argued that the GSS should not be used with individuals with impaired cognitive function, such as those with an intellectual disability (Willner, 2011). Yet, at present, there is no alternative assessment and the GSS remains as a measure that can be criticised as relying too heavily upon cognitive abilities that are specific to its format.

Aims of Present Study

In order to establish whether the GSS paradigm may have some utility with individuals with an ID, this study focuses on the addition of visual material to a reduced scale which has been adapted to improve comprehensibility, thereby combining previous amendments (Cardone & Dent, 1996; Willner, 2008). In addition, measures of certain cognitive domains will be taken: general intellectual ability and visual memory and verbal working memory. The relationship between short term memory and working memory is frequently debated, with the conclusion taken for the purposes of this research that at the very least working memory is not distinct from short term memory and therefore has a significant impact upon memory capability (Cowan, 2008). Using measures of visual memory and verbal working memory will provide information regarding the cognitive capabilities that are supported by the adaptations. Therefore, this present study sets out to examine whether the addition of visual materials to an adapted Gudjonsson Suggestibility Scale will reduce suggestibility levels on the GSS for a population of people with an ID. Furthermore, this study will also explore the relationship between suggestibility scores and the psychological and cognitive variables of anxiety, IQ, visual memory and verbal working memory.

Research Hypotheses

Hypothesis One: the addition of visual materials to an adapted Gudjonsson Suggestibility Scale will improve recall and other suggestibility scores.

Hypothesis Two: the degree to which suggestibility is impacted by the addition of visual supports will be dependent upon cognitive variables of IQ and visual and auditory memory.

Method

Design

A within-subjects counterbalanced design was employed for this study. Responses on the adapted GSS were dependent variables, and IQ, verbal and visual memory, and state anxiety were the independent variables.

Ethics

Ethical approval for the study was granted by the University of Edinburgh School of Health in Social Science Research Ethics Committee (Reference no. CLIN270). Approvals from relevant local ethics committees, such as local councils, were also obtained (see Appendices E[i]-E[iv]). An ID specialist Speech and Language Therapist was consulted on all participant materials (e.g. study information sheets and consent forms) to ensure they were accessible for use with people with an ID (see Appendices F[i]-F[iii]).

Participants

The precedent effect size from Cardone and Dent's (1996) study was used to inform a power calculation for hypothesis one for the present study. They found an effect size of 0.7 on 'yield' when visual stimuli were added to the GSS. Based on this effect size, an 'a priori' sample size calculator (G*Power; Faul, 2007) was used to determine the

minimum number of participants required to detect a medium effect size using a two-tailed paired sample t-test. A significance level of .05, at a power of .80 and with an effect size of .70 would require a minimum of 19 participants. For the second hypothesis relating to how much subsequent change scores on the GSS depends on three independent variables (for example) a sample size was also calculated using an 'a priori' sample size calculator (G*Power; Faul, 2007). Whilst relationships between the independent variables in the present study and GSS are previously established in research, an effect size in relation to change score as a multiple regression outcome variable is uncertain. However, it was expected that these variables will be substantial contributors to the degree to which scores on the GSS vary. As a result, sample size was calculated for a medium-to-large effect size (.25). The use of three predictors, at significance level of .05, at a power of .80 would require a minimum of 48 participants. A 'rule of thumb' outlined by Field (2013) suggests a minimum of 10 cases per predictor for a regression analysis, so based on both recommendations the target sample size for this analysis was set at a minimum of 48.

Inclusion criteria

- Mild intellectual disability (Full-Scale IQ range 55 - 70 [95% confidence interval range includes scores between 45 – 75; APA, 2013; WHO, 1992]).

Exclusion criteria

- Major mental illness, e.g. diagnosis of schizophrenia, current severe depression (as defined by APA, 2013)
- Diagnosis or current query of dementia
- Current substance misuse
- Current involvement with forensic services
- Previous engagement with the primary researcher in a therapeutic setting

In total, 50 individuals participated in the study, but ten sets of collected data were excluded prior to analysis as these individuals' Full Scale IQ scores were above 74.

Recruitment

Managers from colleges and day centres across three regions of Scotland were approached by the primary researcher and information about the study provided (see Appendix G). Thirteen out of the 16 services approached confirmed that their service users might meet criteria. Once members of support staff identified a group of potential participants, they gained consent for them to meet with the primary researcher (PR) to receive further information regarding the study. This was done as a 1:1 meeting with the PR, or in the format of a presentation by the PR to a group. Individuals were given a minimum of 24 hours to consider the information before being asked by members of support staff if they wanted to take part. For those that expressed a further interest in taking part, 1:1 appointments between PR and participant were arranged.

Table 3. Distribution of recruitment sources and final recruitment numbers

Services (n=16) by type	Number of potential participants given information about the study	Number consented	Number non-completed (and reason)	Number completed (unusable)	Included data
Colleges (n=5)	65	21	2 <i>(not considered to have capacity to consent: 1, voluntarily withdrew: 1)</i>	19 (6)	13
Day centres (n=5)	74	25	2 <i>(not considered to have capacity to consent: 2)</i>	23 (4)	19
Social clubs (n=5)	32	7	0	7	7
Advocacy group (n=1)	4	1	0	1	1
Totals	175	54	4	50 (10*)	40

*FSIQ scores (< 45 = 1, and > 75 = 9) were excluded based on the requirement of the confidence interval range of scores to encompass 55-70 FSIQ scores, as per inclusion criteria.

Materials

Demographic information

Information regarding participants' age, gender, marital status, accommodation type, support provision and occupation was collected to describe the sample and guide generalisability of the results (see Appendix H).

Gudjonsson Suggestibility Scales (GSS)

Both parallel versions of the GSS scales were used as part of this study (Gudjonsson, 1997). The story in version one of the GSS relates to a woman that has her handbag stolen whilst on holiday in Spain. The story in version two of the GSS relates to a couple that see a boy that has lost control of his bicycle coming down a hill. Both original versions of the stories are comprised of 40 story concepts each. In the original format, one of the stories is read to the subject before they are asked to recall as much of it as they can, achieving a point for every correctly recalled concept with a maximum score of 40 points (immediate recall score). Following a 50-minute delay, individuals are asked once more how much they can recall about the story, once again achieving a point for every recalled story concept (delayed recall score). Subjects are then asked 20 questions; five questions relating to previously heard story content (e.g. 'Was the woman on holiday in Spain?'), and the rest leading questions (e.g. 'Did the woman's glasses break in the struggle?' when there was no mention of her glasses in the story). The 'yield 1' score represents the number of times a subject yields to a leading question. Once the subject has answered the 20 questions, the administrator provides the following negative feedback regardless of their yield 1 score "You have made a number of errors. It is therefore necessary to go through the questions once more, and this time try to be more accurate." The 20 questions are then repeated and a 'yield 2' and 'shift' score is provided. The 'shift' score represents the number of answers the subject has changed from before the feedback to after the feedback. A total suggestibility score is calculated by adding 'yield 1' and 'shift' scores together. For

the purposes of this study, the original format of the GSS was adapted in a number of ways:

No 50-minute time interval: Participants were questioned about the story immediately following story presentation, instead of after a fifty-minute delay. This was to maximise the recall of information (Willner, 2008)

Reduced components: The number of components of scales that were presented to participants at any one time were halved. For example, the adapted GSS 1 was split into two scales (GSS1a and GSS1b), and each of these were considered a separate story for the participant. Using a reduced component version of the GSS 1 and 2 may support recall thereby reducing the risk of obtaining a floor effect for free recall of information (Willner, 2008).

Inclusion of visual information: The scales were adapted to include visual as well as verbal information (see Cardone & Dent, 1996). Visual information was in the form of pictures depicting 50% of the verbal components. For example, the verbal component ‘they lived in a small bungalow’ was accompanied by a picture of a small bungalow. Pictures were based on Boardmaker™ visual supports (Mayer-Johnson Co., 2002; Appendix I[i] and I[ii]). Along with their corresponding verbal concept, pictures were reviewed and rated by five ID specialist Speech and Language Therapists to ensure they matched each concept.

A Mann-Whitney U test was selected to establish whether there were differences in picture/concept likeness ratings between each of the stories. Distributions of the ratings for each story were similar, as assessed by visual inspection. Ratings for adapted GSS1 (mean rank = 13.50) and GSS2 (mean rank = 11.50) were not statistically significantly different, $U = 60$, $z = -.706$, $p = .514$, using an exact sampling distribution for U (Dineen & Blakesley, 1973). Hence, no changes to the pictures were required.

Pictures were laid-out in a ‘storyboard’ manner, allowing the participant to understand the ‘progression’ of the story. Images then remained with the participant until the story

was finished being read out, then removed prior to participants' immediate recall of the story.

Wording of questioning: The adapted scales contained 11 questions about the story that closely resembled those in the original GSS. Seven of these were misleading questions. An ID specialist Speech and Language Therapist provided consultation on all materials used with participants to ensure they were accessible for use with people with an ID (see Appendices F[i]-F[iii]). Wording was modified to support comprehension, for example, the word 'assailant' was replaced with synonym 'robber', and 'given prison sentences' was replaced with 'went to prison'

Provision of negative feedback: The usual procedures of the GSS would require the participant to be told in a "forceful manner" that there are inaccuracies in their story and that they must answer the questions a second time (Gudjonsson, 1984). Given that these were voluntary participants with intellectual disabilities, "forceful manner" was avoided, and instead participants were told in a clear but directive way that the questioning will have to be repeated ("That was quite good... however, you have made a number of mistakes. So, I'm going to ask you the same questions again. This time I would like you to try harder to see if you can do it better"). This deliberately less forceful wording has been adopted in studies previously (White and Willner, 2005; Willner, 2008), without reducing apparent levels of suggestibility.

Dependent Variables

Immediate recall score: Number of story concepts recalled immediately after it is read to the participant. A maximum score of 20 (100%) is provided for each story. For the purposes of this study, the final score is presented as a percentage of maximum possible score.

Yield 1 score: Each of the seven leading questions that is answered affirmatively or for which a false alternative is chosen, before negative feedback, is scored. Scores are presented as a percentage of the maximum possible score.

Yield 2 score: Similar to ‘yield 1’, but refers to the answers provided after the negative feedback. It provides an indication of how susceptible the participant is to leading questions following the provision of negative feedback. Scores are presented as a percentage of the maximum possible score.

Shift score: A change in response to any of the 11 questions during the second administration of questions (following negative feedback). This score provides an indication of how susceptible the participant is to negative feedback. Scores are presented as a percentage of the maximum possible score.

Total suggestibility score: The sum of ‘yield 1’ and ‘shift’ scores. Scores are presented as a percentage of the maximum possible score.

Independent Variables

Intelligence: The two subtest Wechsler Abbreviated Scale of Intelligence, Second Edition (WASI-II; Wechsler, 2011) was utilised for the attainment of an FSIQ score for each participant. Split half reliability for the two subtest WASI-II is reported by the authors of the test to be adequate for each of the sub-tests it is comprised of (0.9 and 0.92), as well as for the overall FSIQ score (0.94; Weschler, 2011). Concurrent validity has also been established with non-abbreviated measures of IQ, such as the Wechsler Adult Intelligence Scales 4th Edition (WAIS-IV; Wechsler, 2008; Maccow, 2011). The WASI-II was completed as the last stage in the procedure as it was considered that it might influence performance in the experimental phase, should participants perceive that they had performed poorly on this assessment, and hence their confidence in their abilities be influenced. As participants’ intellectual functioning could only be established after participant participation, data from those whose intellectual functioning fell outside the range specified in the inclusion criteria were excluded prior to data analysis.

Verbal working memory: The Digit Span sub-test of the Wechsler Adult Intelligence Scales 4th Edition (WAIS-IV; Wechsler, 2008) was used to assess verbal working memory. The authors of the WAIS-IV report a ‘good’ corrected stability coefficient for the digit span sub-test (0.83). The digit span task has also been found to have consistently adequate validity (Elwood, 1991). Other digit span measures of verbal working memory with better reliability and validity exist (Woods et al., 2011), however due to practical limitations (e.g. accessing validated computerised auditory presentation of digits) the original format (as in the WAIS-IV) was adopted in this study with the acceptance of a possible compromise to overall reliability and validity (Cowan et al., 2008).


Visual memory: Version A form of the Visual Patterns Test (VPT; Della Sala, Gray, Baddeley & Wilson, 1997) was used to assess visual memory. Based on a sample of 50 healthy British subjects aged 20-81 years, the authors of the test report acceptable test re-test reliability of 0.75 for version A. The measure is thought to provide a more valid and accurate measure of visual working memory, as opposed to other measures that merge both visual and spatial working memory capacities (Della Sala, Grey, Baddeley, Allamano & Wilson, 1999).

State anxiety: Due to the lack of a validated and reliable measure of situational anxiety for people with an ID, Dagnan *et al.* (2008)’s adapted version of the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983) was administered as a measure of situational anxiety that is more suited to individuals with an ID. This was further adapted using guidance from an ID specialist Speech and Language Therapist to improve comprehensibility and administered using some visual quantifiers to support participant understanding and choice. Anxiety scores for each of the 7 items can range from 0 = not at all, to 3 = very much, with the highest possible anxiety score being 21).

Procedure

Consent to participate was gained at the 1:1 appointment with the PR. The purpose of the study was reiterated and a judgement on the individual's capacity to consent was made. The elements of the study were completed in the following order: (i) demographics questionnaire, (ii) adapted suggestibility scales (each participant completed both 'verbal' and 'verbal + visual' versions of the adapted scales and the order of presentation of these was alternated for the purpose of counterbalancing (see Figure 2), (iii) state anxiety measure, (iv), digit-span, (v) VPT, (vii) two subtest WASI-II. All participants were debriefed immediately after the session. All debriefs included the reading of a passage that explained why they had been told they had made a mistake when answering questions about the stories (see Appendix J). The average length of time for administration was 67 minutes.

Figure 2. Order of adapted GSS presentation for participants



Stream number	Participant number	Order of Presentation of Measures
1	1	GSS1a (verbal only) → GSS2a (verbal + visuals)
2	2	GSS2a (verbal only) → GSS1a (verbal + visuals)
3	3	GSS1a (verbal + visuals) → GSS2a (verbal only)
4	4	GSS2a (verbal + visuals) → GSS1a (verbal only)
5	5	GSS1b (verbal only) → GSS2b (verbal + visuals)
6	6	GSS2b (verbal only) → GSS1b (verbal + visuals)
7	7	GSS1b (verbal only) → GSS2b (verbal + visuals)
8	8	GSS2b (verbal only) → GSS1b (verbal + visuals)
1	9	GSS1a (verbal only) → GSS2a (verbal + visuals)
2	10	GSS2a (verbal only) → GSS1a (verbal + visuals)
Etc.	Etc.	Etc.

Data analysis

Shapiro-Wilks Test was used to establish the normality of data, and non-parametric alternative analyses were used when violations of normality were indicated. Data were also screened for statistical assumptions relevant to the analysis method employed. Descriptive statistics were used to summarise the demographic data collected from participants. Two-tailed paired sample t-tests were employed to establish whether the addition of visuals to adapted GSS reduced suggestibility scores when compared to verbal only scales. Finally, a multiple regression was used to explore the predictive

qualities of certain independent variables against the dependant variable (total suggestibility change scores).

Results

Participant demographics are presented in Table 1.

Table 3. Summary of participant demographics

<i>n</i> = 40	
Age	Mean 34.6 years (range 16-67 years, standard deviation 15.2)
Male (%)	20 (50)
Female (%)	20 (50)
Marital status... (%)	
Single	27 (67.5)
Separated	1 (2.5)
Unmarried couple	11 (27.5)
Married	1 (2.5)
FSIQ composite score	Mean 58.6 (range FSIQ 49-74*, standard deviation 5.5)
Lives with... (%)	
Family	29 (72.5)
Alone	6 (15)
Shared housing	3 (7.5)
Co-habiting	1 (2.5)
Non-family carer	1 (2.5)
Main carer (%)	
Support worker/carers	20 (50)
Parent	15 (37.5)
None	3 (7.5)
Sibling	2 (5)
Occupation is... (%)	
Unemployed	26 (65)
College student	9 (22.5)
Paid employment	3 (7.5)
Voluntary work	2 (5)

* Participants with FSIQ scores between 45 and 75 were included as the confidence interval range encompassed scores within 55-70 range as per inclusion criteria

Anxiety, Visual and Verbal Working Memory

The mean anxiety score (adapted HADS) was 1.98 (SD = 2.90, maximum = 13, minimum = 0), visual memory (VPT) was 3.53 (SD = 1.6) with scores <5.8 representing 5th percentile or less when compared test norms. Mean digit span score for the current sample was 3.95 (SD = 1.04). The mean administration time was 67 minutes (max. = 96, min. = 49).

Hypothesis One: The addition of visual information will improve recall and reduce suggestibility scores

New variables representing difference scores between ‘verbal only’ and ‘verbal + visual’ were computed to compare mean scores on the GSS (e.g. ‘yield 1 difference score’). Due to violations of normality for recall, yield 1, yield 2, and fabrication score distributions, the Wilcoxon Signed Rank Test was used to compare median scores. Extreme outliers for these variables were identified (at least three box lengths away from edge of boxplot), and the decision was made to retain these and proceed with non-parametric analyses (Laerd Statistics, 2015). Paired-samples t-tests were employed to compare means for the remaining normally distributed variables. No extreme outliers were detected for these variables following inspection of relevant boxplots. No significant differences were found between presentation formats for suggestibility scores, see Table 2 for summary of these results. Therefore the hypothesis that the addition of visual information would reduce suggestibility scores was rejected.

Table 4. Differences between mode of adapted GSS presentation (verbal only and verbal + visuals)

	Verbal only mean (SD)/median	Verbal + Visual mean (SD)/median	z / t(df) statistic	Sig. (p value)
Memory recall	17	21	z = -1.031	.303
Yield 1	100	100	z = -.575	.566
Yield 2	100	100	z = .534	.593

Shift	34.50 (23.99)	39.22 (27.24)	t(39) = .88	.386
Total	62.25 (13.29)	65.10 (15.35)	t(39)= 1.16	.252
Suggestibility				
Distortions	1.22 (1.05)	1.58 (1.20)	t(39)= 1.47	.151
Fabrications	1	0	z = 1.293	.196
Total	2.28 (1.65)	2.33 (1.86)	t(39) = .17	.866
confabulations				

Hypothesis Two: The degree to which suggestibility scores are impacted by the addition of visual supports will be dependent upon anxiety, IQ, verbal and visual memory ability

A correlation matrix was computed to explore the relationships between variables and change scores for suggestibility scores. Due to the number of variables that violated the assumption of normality, non-parametric Spearman's correlation analyses were used for the remaining variables and a point bi-serial correlation (r_{pb}) is reported for the dichotomous variable gender (see Table 5).

Table 5. Correlation matrix for suggestibility change scores and independent variables age, gender, FSIQ, visual memory and verbal working memory

	1	2	3	4	5
1 Age	-	-	-	-	-
2 Gender	-.126	-	-	-	-
3 FSIQ	-.063	.050	-	-	-
4 Visual memory	-.302	.188	.449**	-	-
5 Verbal working memory	-.105	.136	.542**	.291	-
6 Change score (total suggestibility)	.132	-.039	-.240	-.337*	-.290
7 Change score (immediate recall)	-.293	.204	-.062	.061	-.062
8 Change score (yield 1)	.089	.056	-.097	.023	-.000
9 Change score (yield 2)	.282	.015	-.026	.034	.091
10 Change score (shift)	.133	-.004	-.186	-.393*	-.335*
11 Change scores (distortions)	-.129	.051	.171	.135	.189
12 Change scores (fabrications)	.208	-.400*	-.287	-.100	-.418**
13 Change scores (total confabulations)	-.040	-.243	.010	.110	-.166

*significant at $p \leq 0.05$, ** significant $p \leq 0.01$

Multiple regression

An exploratory multiple regression was conducted to determine the extent to which variation in the dependant variable ‘change score (total suggestibility)’ was explained by certain independent variables. From inspecting the correlations in Table 3, only visual memory scores were found to correlate with the dependant variable so this was used as the independent variable for the exploratory multiple regression analysis.

Assumptions for multiple regression analysis

An analysis of standard residuals was carried out. This showed that the data did not contain any outliers (Std. Residual Min = -2.25, Std. Residual Max = 2.50). Multicollinearity was not a concern for the dataset (visual memory scores, Tolerance = 1.00, VIF = 1.00). The data met the assumption of independent errors (Durbin-Watson value = 1.94). A scatterplot of standardised predicted values confirmed that the data met the assumptions of homogeneity of variance and linearity. The data also met the assumption of non-zero variances (total suggestibility change scores, variance = 239.82; visual memory scores, variances = 2.56).

It was found that visual memory scores explain a significant amount of the variance in the ‘change score (total suggestibility)’, $F(2, 37) = 7.66, p = .009$. $R^2 = .17$, adj. $R^2 = .15$. The effect size for this analysis ($f^2 = .20$) was found to meet Cohen’s (1988) convention for a medium to large effect (Soper, 2017). This partially supports the hypothesis that change in suggestibility scores is dependent on certain cognitive variables more than others.

Discussion

The first aim of this study was to establish whether the addition of supplementary visual information to an adapted version of the GSS would reduce subsequent suggestibility on this measure. Based on previous research, it was hypothesised that

the inclusion of visual information would lead to improved recall, and consequently a reduction in suggestibility scores.

However, in contrast to the findings of Cardone and Dent (1996), the addition of visual information did not improve recall ability significantly. Furthermore, the present study did not replicate their finding of a reduction in yield responses with the addition of visual information, although both this study and Cardone and Dent's (1996) study had similar findings in relation to shift scores, in that these were not significantly reduced with the addition of visuals.

Whilst not reaching statistical significance, it is noted that in the present study there is a marginal trend for greater suggestibility with the addition of visual information, with the exception of recall scores which saw a trend in the hypothesised direction. Bowden (1992) noted a similar trend in the results of his study, which explored the addition of visual information in the form of video. There is a possibility that the presentation of two types of information (despite portraying the same content) increased the cognitive load on participants to the point that encoding of information was either compromised or not given additional support. Thistle & Wilkinson (2013) summarised research on augmentative and alternative communication (AAC), highlighting that, in many cases, these have been found to place additional demands on working memory, and not support comprehension and subsequent recall. Further lessons can be learned from a recent article by Cameron and Matthews (2017) which describes the process of developing an accessible visual communication resource for people with an ID. In their article, they emphasise their recommendation that supporting images should be a scaffold to understanding that does not overload or complicate the concept.

There is also a possibility that when presented with accompanying visuals without warning or instruction, individuals may have understood there to be two tasks to divide their attention between, again compromising performance. It may also be that the external visuals interrupted forming of their own, arguably more meaningful, mental image of the event, something that may help encoding and subsequent retrieval (McDaniel & Pressley, 2012; Vredeveldt, Hitch, & Baddeley, 2011). Whilst the use of

external visuals may support comprehension of the content, they may not sufficiently support the different (albeit related) processes of encoding and consolidation to memory. The above may explain the lack of a positive effect in the present study.

A second aim of this research was to explore further the relationships between suggestibility scores and cognitive variables. It was anticipated that recall would relate to total suggestibility scores (as found by Gudjonsson and Clare, 1995, and Milne, Clare and Bull, 2002); however, in this present sample this was not found to be the case. Based on previous findings, if recall performance was not improved by the addition of visual materials, we should not expect a reduction in suggestibility scores either. Interestingly, the findings of the present study replicated the results of Willner (2008) who also found that for his sample recall performance did not correlate with suggestibility performance. It may be that better recall ability increases resistance to suggestibility, whereas low recall ability does not always result in someone being more suggestible.

It was anticipated that a significant inverse relationship would be found between IQ and suggestibility scores, in replication of previous research; however, this was not found to be the case for this sample. It may be that a wider range of suggestibility and IQ scores are needed for this effect to emerge. As one may expect - given their involvement in global cognitive functioning - significant positive relationships were found between IQ and verbal and visual memory abilities.

Another finding from the present study that contrasts with previous research is the lack of relationship indicated between anxiety and suggestibility. It was hypothesised that there would be a positive correlation between anxiety ratings and GSS performance. These inconsistent results may relate to the potential unreliability of self-report measures of anxiety amongst individuals with an ID. This explanation was made more credible by discrepancies apparent to and noted by the primary researcher between observed unease and self-reported anxiety during some administration interviews. It is because of the lack of a validated and reliable measure of situational anxiety for individuals with an ID that an adapted (and non-validated) measure had to be used,

potentially compromising the reliability of the scores obtained. In an attempt to buffer this compromise, the measure used for the present study was based on one previously used by Dagnan et al., (2008) with people with an ID, and was verified for use by an ID specialist Speech and Language Therapist. It may also be that it is a stress response activated following the provision of feedback, rather than anxiety. As all the questions relate to anxiety, stress levels may go undetected despite being an influencing factor as hypothesised.

A negative correlation was observed between the change in participants' shift scores and visual and verbal working memory ability. This may indicate that shift scores tend to reduce with better visual and verbal working memory ability. During the exploratory correlational analyses a negative association was identified between fabrication and verbal working memory ability, suggesting that as verbal working memory ability increases, the amount of fabricated recalled information reduces. Whilst caution must be exercised when postulating these findings due to the exploratory nature of the analyses, it may be that those with poorer verbal working memory feel more pressure to produce answers and therefore on recollection confabulate, or make logical suggestions about the story's content.

A further aim of this study was to explore the theoretically proposed relationship between certain cognitive variables with the suggestibility change scores. It was predicted that the cognitive variables (IQ, verbal working memory and visual memory) would be found to contribute to how much GSS scores changed with the addition of visuals. As any change in scores with the addition of visuals was not deemed significant, no inferential conclusions can be drawn from these results. Nevertheless, it seemed that visual memory contributed to total suggestibility change scores to an extent sufficient for detection. These findings suggest that better visual memory is associated with better total suggestibility score outcomes with the addition of visuals.

Strengths

A significant strength of this research was the range of individuals included; particularly in relation to age, gender and spread of IQ scores within the mild ID range. From the demographics reported we can approximate that this sample was representative of the wider UK population of individuals with a mild ID (Scottish Government, 2013). A further strength of this research was the use of a within subjects counterbalanced design which accounted for order effects related to whether visuals were presented with the first or second adapted GSS presentation, and which version of the adapted GSS was used (1 or 2).

Limitations and future research

The degree to which participants comprehended the stories read to them may have influenced responses and subsequent outcomes on the GSS (Thorndyke, 1977; Gudjonsson, 1990), but this was not assessed as part of the study design. It is also possible that using two halves of one story in isolation may compromise the value of having one single story that has a clear beginning, middle and end. Therefore, the loss of this contextual information may have inadvertently hindered comprehension, encoding and subsequent recall.

For the aforementioned reasons, it may have been useful to incorporate a story comprehensibility check into the pilot administrations. This would verify the wording adaptations recommended by the ID specialist SLT during materials development were beneficial. It may have been useful to include visual information as part of the leading questioning instead of this part being verbal only. As such, it would be interesting to explore whether individuals' suggestibility tends to be similar for both visual and verbal information.

As most of the questions asked as part of the GSS are in a yes/no format, response choices may be restricted. This may mean that individuals think they must choose between yes and no, instead of knowing they can also respond "I don't know" or "I cannot remember". This is particularly pertinent to those that tend to acquiesce or guess in the face of uncertainty, such as individuals with an ID (Heal & Sigelman,

1995; Finlay & Lyons, 2002). In which case, individuals would still be considered to be suggestible therefore unduly inflating their suggestibility score. Future studies could make clear the response options at the start of the questioning to see whether this influences the range of responses people subsequently give. An alternative would be to ask individuals to provide confidence ratings for accuracy of their responses.

Implications

This present study does not support the use of augmenting the GSS with visual material, even when adaptations are made to simplify the measure. Some of the results have alluded to the role of certain cognitive variables (e.g. visual memory) in interrogative suggestibility but no conclusions can be drawn with confidence. Whilst there is no shortage of research on the interrogative suggestibility more generally, it remains unclear what cognitive variables are implicated.

In summary, it is acknowledged that theoretical conclusions are difficult to draw from these findings. What is clear is that more research in this area is required to better understand the appropriateness of using the GSS amongst the population of people with an ID.

Conflict of interest declaration

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References for Empirical Study

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders: DSM-5. Washington, D.C: American Psychiatric Association.

Baddeley, A., Eysenck, M. W., & Anderson, M. C. (2009). Memory. East Sussex.

Beail, N. (2002). Interrogative Suggestibility, Memory and Intellectual Disability. *Journal of Applied Research in Intellectual Disabilities*, 15, 129 – 137.

Bowden, K. M. (1998). *Interrogative suggestibility of people with a learning disability – the influence of mode of assessment*. (Unpublished doctoral thesis). University of Glasgow, UK.

Bruck, M., & Melnyk, L. (2004). Individual differences in children's suggestibility: A review and synthesis. *Applied Cognitive Psychology*, 18(8), 947–996.

Cameron, L., & Matthews, R. (2017). More than pictures: developing an accessible resource. *Tizard Learning Disability Review*, 22(2), 57–65.

Cardone, D., & Dent, H. (1996). Memory and interrogative suggestibility: The effects of modality of information presentation and retrieval conditions upon the suggestibility scores of people with learning disabilities. *Legal and Criminological Psychology*, 1(2), 165-177.

Clare, I. C. H., & Gudjonsson, G. H. (1993). Interrogative suggestibility, confabulation, and acquiescence in people with mild learning disabilities (mental handicap): Implications for reliability during police interrogations. *British Journal of Clinical Psychology*, 32(3), 295–301.

Cowan, N. (2008). What are the differences between long-term, short-term and working memory? *Prog Brain Res*, 169, 323-338.

Cowan, N., Morey, C. C., Chen, Z., Gilchrist, A. L., & Saults, J. S. (2008). Theory and Measurement of Working Memory Capacity Limits. *Psychology of Learning and Motivation, 49*, 49–104.

Dagnan, D., Jahoda, A., McDowell, K., Masson, J., Banks, P. & Hare, D. (2008). The psychometric properties of the hospital anxiety and depressions scale adapted for use with people with intellectual disabilities. *Journal of Intellectual Disability Research, 11*. 942 – 949.

Della Sala S, Gray C, Baddeley A, Wilson L. (1997) The Visual Patterns Test: A new test of short-term visual recall. Thames Valley Test Company. Feltham: Suffolk, UK

Della Sala S, Gray C, Baddeley A, Allamano, N., & Wilson L. (1999) Pattern span: a tool for unwelding visuo-spatial memory. *Neuropsychologia, 37*. 1189-1199

Dineen, L. C., and B. C. Blakesley. 1973. Algorithm AS 62: Generator for the sampling distribution of the Mann-Whitney U statistic. *Applied Statistics, 22*, 269-273.

Elwood, R. W. (1991). The Wechsler Memory Scale-Revised: psychometric characteristics and clinical application. *Neuropsychology Review, 2*(2), 179–201.

Everington, C., & Fulero, S. M. (1999). Competence to confess: Measuring understanding and suggestibility of defendants with mental retardation. *Mental Retardation*. US: American Assn on Mental Retardation.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods, 39*, 175-191

Field, A. P. (2013). *Discovering statistics using IBM SPSS Statistics: And sex and drugs and rock 'n' roll* (4th ed.). London: Sage.

Finlay, W. M., & Lyons, E. (2002). Acquiescence in interviews with people who have mental retardation. *Mental retardation*, 40(1), 14-29.

Gudjonsson, G. H., & Clare, I. C. (1995). The relationship between confabulation and intellectual ability, memory, interrogative suggestibility and acquiescence. *Personality and Individual Differences*, 19(3), 333-338.

Gudjonsson, G. H. (1997). *The Gudjonsson Suggestibility Scales Manual*. Hove, East Sussex: Psychology Press.

Gudjonsson, G. H. (1984). A new scale of interrogative suggestibility. *Personality and Individual Differences*, 5(3), 303 - 314.

Gudjonsson, G. H. (1987). A parallel form of the Gudjonsson Suggestibility Scale. *British Journal of Clinical Psychology*, 26, 215 - 221.

Gudjonsson, G. H. (1990). The relationship of intellectual skills to suggestibility, compliance and acquiescence. *Personality and individual differences*, 11(3), 227-231.

Heal, L. W., & Sigelman, C. K. (1995). Response biases in interviews of individuals with limited mental ability. *Journal of Intellectual Disability Research*, 39(4), 331-40.

Howells, K. & Ward, M. (1994). Intellectual impairment, memory impairment, suggestibility and voir dire proceedings: a case study. *Medicine, Science & the Law*, 34, 176 – 180.

Hritz, A. C., Royer, C. E., Helm, R. K., Burd, K. A., Ojeda, K., & Ceci, S. J. (2015). Children's suggestibility research: Things to know before interviewing a child. *Anuario de Psicologia Juridica*, 25(1), 3-12.

Kebbell, M. R., & Hatton, C. (1999). People with mental retardation as witnesses in court: A review. *Mental retardation*, 37(3), 179-187.

Laerd Statistics (2015). Paired-samples t-test using SPSS Statistics. *Statistical tutorials and software guides*. Retrieved from <https://statistics.laerd.com/>

Laerd Statistics (2015). Spearman's correlation using SPSS Statistics. *Statistical tutorials and software guides*. Retrieved from <https://statistics.laerd.com/>

Laerd Statistics (2015). Simple linear regression using SPSS Statistics. *Statistical tutorials and software guides*. Retrieved from <https://statistics.laerd.com/>

Loftus, E. F., & Palmer, J. C. (1974). Reconstruction of automobile destruction: An example of the interaction between language and memory. *Journal of verbal learning and verbal behavior*, 13(5), 585 - 589.

Maccow, G. (2011). *Overview of WASI-II*. In P. C. C. Service (Ed.): Pearson Corporation.

Mayer-Johnson, Inc. (2002). Boardmaker. Solana Beach, California. Mayer-Johnson, Inc.,

McDaniel, M., & Pressley, M. (Eds.). (2012). *Imagery and related mnemonic processes: Theories, individual differences, and applications*. Springer Science & Business Media.

Milne, R., Clare, I. C. H., & Bull, R. (2002). Interrogative suggestibility among witnesses with mild intellectual disabilities: The use of an adaptation of the GSS. *Journal of Applied Research in Intellectual Disabilities*. 15. 8-17.

Morgan, J. J. (1924). The nature of suggestibility. *Psychological Review*, 31(6), 463.

Orne, M. T. (1977). The construct of hypnosis: Implications of the definition for research and practice. *Annals of the New York Academy of Sciences*, 296(1), 14-33.

Ridley, A. M., & Gudjonsson, G. H. (2012). Suggestibility and Individual Differences. In *Suggestibility in Legal Contexts* (pp. 85–106). John Wiley & Sons, Ltd.

Ridley, A. M. (2013). Suggestibility: a history and introduction. In A. M. Ridley, F. Gabbert & D. J. La Rooy (Eds.), *Suggestibility in legal contexts: psychological research and forensic implications*. Oxford, UK: John Wiley & Sons. Pp 1-19.

Scottish Government (2013). Keys To Life: Improving Quality of Life for People with Learning Disabilities. Retrieved from: <http://keystolife.info/wp-content/uploads/2014/05/the-keys-to-life-full-version.pdf>

Sporer, S. L. (1982). A brief history of the psychology of testimony. *Current Psychological Reviews*, 2, 323 – 339.

Thistle, J. J. & Wilkinson, K. M. (2013) Working Memory Demands of Aided Augmentative and Alternative Communication for Individuals with Developmental Disabilities. *Augmentative and Alternative Communication*, 29(3), 235-245.

Thorndyke, P. W. (1977). Cognitive structures in comprehension and memory of narrative discourse. *Cognitive psychology*, 9(1), 77-110.

Vredeveltdt, A., Hitch, G. J., & Baddeley, A. D. (2011). Eyeclosure helps memory by reducing cognitive load and enhancing visualisation. *Memory & cognition*, 39(7), 1253-1263.

Wechsler, D. (2011). *Wechsler Abbreviated Scale of Intelligence - Second Edition*. San Antonio, TX: Pearson.

Wechsler D. (2008). *Wechsler Adult Intelligence Scale - Fourth Edition*. San Antonio, TX: Pearson.

White, R. & Willner, P. (2005). Suggestibility and salience in people with intellectual disabilities: An experimental critique of the Gudjonsson Suggestibility Scale. *The Journal of Forensic Psychiatry & Psychology*, 16(4), 638 – 650.

Willner, P. (2011). Assessment of capacity to participate in court proceedings: a selective critique and some recommendations. *Psychology, Crime & Law*, 17(2), 117-131.

Willner, P. (2008). Clarification of the memory artefact in the assessment of suggestibility. *Journal of Intellectual Disability Research*, 52(4), 318-326.

Woods, D. L., Kishiyama, M. M., Yund, E. W., Herron, T. J., Edwards, B., Poliva, O., Reed, B. (2011). Improving digit span assessment of short-term verbal memory. *Journal of Clinical and Experimental Neuropsychology*, 33(1), 101–111.

World Health Organization. (1992). The ICD-10 classification of mental and behavioural disorders: Clinical descriptions and diagnostic guidelines. Geneva: World Health Organization.

Zigmond, A.S., & Snaith, R.P. (1983). The Hospital Anxiety And Depression Scale. *Acta Psychiatrica Scandinavica*. 67, 361 – 370.

Thesis Portfolio References

Abbasi, N. ul H., & Hong, L. (2012). Assessing Interrogative Suggestibility, an adaptation of Gudjonsson Suggestibility Scale (GSS): Gender Difference in witnessing an event. *International Journal of Social Science & Education*, 3(1), 159–165.

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders: DSM-5. Washington, D.C: American Psychiatric Association.

Altman, D. G. (1999). *Practical statistics for medical research*. New York, NY: Chapman & Hall/CRC Press

Baddeley, A., Eysenck, M. W., & Anderson, M. C. (2009). Memory. East Sussex.

Bain, S. & Baxter, J. S. (2000). Interrogative suggestibility: The role of interviewer behaviour. *Legal and Criminological Psychology*, 5, 123–133.

Baxter, J. S. (1990). The suggestibility of child witnesses: A review. *Applied Cognitive Psychology*, 4(5), 393-407.

Beail, N. (2002). Interrogative Suggestibility, Memory and Intellectual Disability. *Journal of Applied Research in Intellectual Disabilities*. 15. 129 – 137.

Blagrove, M. (1996). Effects of length of sleep deprivation on interrogative suggestibility. *Journal of Experimental Psychology: Applied*, 2(1), 48–59.

Bowden, K. M. (1998). *Interrogative suggestibility of people with a learning disability – the influence of mode of assessment*. (Unpublished doctoral thesis). University of Glasgow, UK.

British Psychological Society. (2015). Guidance on the assessment and diagnosis of intellectual disabilities in adulthood, 1–36.

Bruck, M., & Melnyk, L. (2004). Individual differences in children's suggestibility: A review and synthesis. *Applied Cognitive Psychology*, 18(8), 947–996.

Cameron, L., & Matthews, R. (2017). More than pictures: developing an accessible resource. *Tizard Learning Disability Review*, 22(2), 57–65.

Cardone, D., & Dent, H. (1996). Memory and interrogative suggestibility: The effects of modality of information presentation and retrieval conditions upon the suggestibility scores of people with learning disabilities. *Legal and Criminological Psychology*, 1(2), 165–177.

Clare, I. C. H., & Gudjonsson, G. H. (1993). Interrogative suggestibility, confabulation, and acquiescence in people with mild learning disabilities (mental handicap): Implications for reliability during police interrogations. *British Journal of Clinical Psychology*, 32(3), 295–301.

Cowan, N. (2008). What are the differences between long-term, short-term and working memory? *Prog Brain Res*, 169, 323–338.

Cowan, N., Morey, C. C., Chen, Z., Gilchrist, A. L., & Saults, J. S. (2008). Theory and Measurement of Working Memory Capacity Limits. *Psychology of Learning and Motivation*, 49, 49–104.

Crawford, J. R., Allan, K. M., & Jack, A. M. (1992). Short forms of the UK WAIS-R: Regression equations and their predictive validity in a general population sample. *British Journal of Clinical Psychology*, 31(2), 191–202.

Critical Appraisal Skills Programme (2017). CASP Cohort Study Checklist. Retrieved from: http://media.wix.com/ugd/dded87_5ad0ece77a3f4fc9bcd3665a7d1fa91f.pdf

Dagnan, D., Jahoda, A., McDowell, K., Masson, J., Banks, P. & Hare, D. (2008). The psychometric properties of the hospital anxiety and depressions scale adapted for use with people with intellectual disabilities. *Journal of Intellectual Disability Research*, 11. 942 – 949.

Della Sala S, Gray C, Baddeley A, Wilson L. (1997) The Visual Patterns Test: A new test of short-term visual recall. Thames Valley Test Company. Feltham: Suffolk, UK

Della Sala S, Gray C, Baddeley A, Allamano, N., & Wilson L. (1999) Pattern span: a tool for unwinding visuo-spatial memory. *Neuropsychologia*, 37. 1189-1199

Dineen, L. C., and B. C. Blakesley. 1973. Algorithm AS 62: Generator for the sampling distribution of the Mann-Whitney U statistic. *Applied Statistics*, 22, 269-273.

Dukala, K., & Polczyk, R. (2014). Age and interviewer behavior as predictors of interrogative suggestibility. *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, 69(3), 348–355.

Dunn, L. M., & Dunn, L. M. (1982). *The British Picture Vocabulary Scale*. Windsor, England: NFER-Nelson.

Drake, K. E. (2010). Interrogative suggestibility: Life adversity, neuroticism, and compliance. *Personality and Individual Differences*, 48, 493–498.

Dwan, K., Gamble, C., Williamson, P. R., & Kirkham, J. J. (2013). Systematic review of the empirical evidence of study publication bias and outcome reporting bias—an updated review. *PloS one*, 8(7), 66-84

Emerson, E., Hatton, C., Dickson, K., Gone, R., Caine, A., & Bromley, J. (2012). *Clinical Psychology and People with Intellectual Disabilities – 2nd Edition*. Chichester: Wiley & Sons

Elwood, R. W. (1991). The Wechsler Memory Scale-Revised: psychometric characteristics and clinical application. *Neuropsychology Review*, 2(2), 179–201.

Everington, C., & Fulero, S. M. (1999). Competence to confess: Measuring understanding and suggestibility of defendants with mental retardation. *Mental Retardation*. US: American Assn on Mental Retardation.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191

Field, A. P. (2013). Discovering statistics using IBM SPSS Statistics: And sex and drugs and rosk ‘n’ roll (4th ed.). London: Sage.

Finlay, W. M., & Lyons, E. (2002). Acquiescence in interviews with people who have mental retardation. *Mental retardation*, 40(1), 14-29.

Gudjonsson, G. H. (1990). The relationship of intellectual skills to suggestibility, compliance and acquiescence. *Personality and individual differences*, 11(3), 227-231.

Gudjonsson, G. H. (1997). The Gudjonsson Suggestibility Scales Manual. Hove, East Sussex: Psychology Press.

Gudjonsson, G. H., Murphy, G. H., & Clare, I. C. (2000). Assessing the capacity of people with intellectual disabilities to be witnesses in court. *Psychological Medicine*, 30(02), 307-314.

Gudjonsson, G. H., & Clare, I. C. (1995). The relationship between confabulation and intellectual ability, memory, interrogative suggestibility and acquiescence. *Personality and Individual Differences*, 19(3), 333-338.

Gudjonsson, G. H. & Clark, N. K. (1986). Suggestibility in Police Interrogation: A Social Psychological Model. *Social Behaviour, 1*, 83-104.

Gudjonsson, G. H. (1983). Suggestibility, intelligence, memory recall and personality: An experimental study. *British Journal of Psychiatry, 142*(1), 35–37.

Gudjonsson, G. H., & Henry, L. (2003). Child and adult witnesses with intellectual disability: The importance of suggestibility. *Legal and Criminological Psychology, 8*(2), 241-252.

Gudjonsson, G. H. (1984). A new scale of interrogative suggestibility. *Personality and individual differences, 5*(3), 303-314.

Gudjonsson, G. H. (1988). Interrogative suggestibility: Its relationship with assertiveness, social-evaluative anxiety, state anxiety and method of coping. *British Journal of Clinical Psychology, 27*(2), 159-166.

Gudjonsson, G. H. (1987). A parallel form of the Gudjonsson Suggestibility Scale. *British Journal of Clinical Psychology, 26*. 215 - 221.

Hayes, S. C. (2000). Hayes Ability Screening Index (HASI).

Heal, L. W., & Sigelman, C. K. (1995). Response biases in interviews of individuals with limited mental ability. *Journal of Intellectual Disability Research, 39*(4), 331–40.

Henry, L. A., & Gudjonsson, G. H. (2007). Individual and developmental differences in eyewitness recall and suggestibility in children with intellectual disabilities. *Applied Cognitive Psychology, 21*(3), 361-381.

Hooper, V. R., Chou, S., & Browne, K. D. (2016). A systematic review on the relationship between self-esteem and interrogative suggestibility. *Journal of Forensic Psychiatry & Psychology, 27*(6), 761–785

Howells, K. & Ward, M. (1994). Intellectual impairment, memory impairment, suggestibility and voir dire proceedings: a case study. *Medicine, Science & the Law*, 34, 176 – 180.

Hritz, A. C., Royer, C. E., Helm, R. K., Burd, K. A., Ojeda, K., & Ceci, S. J. (2015). Children's suggestibility research: Things to know before interviewing a child. *Anuario de Psicología Jurídica*, 25(1), 3–12.

Kebbell, M. R., & Hatton, C. (1999). People with mental retardation as witnesses in court: A review. *Mental retardation*, 37(3), 179-187.

Laerd Statistics (2015). Cohen's kappa using SPSS Statistics. *Statistical tutorials and software guides*. Retrieved from <https://statistics.laerd.com/>

Laerd Statistics (2015). Paired-samples t-test using SPSS Statistics. *Statistical tutorials and software guides*. Retrieved from <https://statistics.laerd.com/>

Laerd Statistics (2015). Spearman's correlation using SPSS Statistics. *Statistical tutorials and software guides*. Retrieved from <https://statistics.laerd.com/>

Laerd Statistics (2015). Simple linear regression using SPSS Statistics. *Statistical tutorials and software guides*. Retrieved from <https://statistics.laerd.com/>

Loftus, E. F., & Palmer, J. C. (1974). Reconstruction of automobile destruction: An example of the interaction between language and memory. *Journal of verbal learning and verbal behavior*, 13(5), 585 - 589.

Maccow, G. (2011). *Overview of WASI-II*. In P. C. C. Service (Ed.): Pearson Corporation.

Mayer-Johnson, Inc. (2002). Boardmaker. Solana Beach, California. Mayer-Johnson, Inc.,

McDaniel, M., & Pressley, M. (Eds.). (2012). *Imagery and related mnemonic processes: Theories, individual differences, and applications*. Springer Science & Business Media.

McGroarty, A. & Thomson, H. (2012). Negative emotional states, life adversity, and interrogative suggestibility. *Legal and Criminological Psychology*, 1-13

McHugh, M. (2012). Interrater reliability: the kappa statistic. *Biochemia Medica*, 22(3), 276–282.

Milne, R., Clare, I. C. H., & Bull, R. (2002). Interrogative suggestibility among witnesses with mild intellectual disabilities: The use of an adaptation of the GSS. *Journal of Applied Research in Intellectual Disabilities*. 15. 8-17.

Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 6(7).

Morgan, J. J. (1924). The nature of suggestibility. *Psychological Review*, 31(6), 463.

O'Connell, M. J., Garmoe, W., & Goldstein, N. E. S. (2005). Miranda comprehension in adults with mental retardation and the effects of feedback style on suggestibility. *Law and Human Behavior*, 29(3), 359.

Orne, M. T. (1977). The construct of hypnosis: Implications of the definition for research and practice. *Annals of the New York Academy of Sciences*, 296(1), 14-33.

Polczyk, R. (2005). Interrogative suggestibility: Cross-cultural stability of psychometric and correlational properties of the Gudjonsson Suggestibility Scales. *Personality and Individual Differences*, 38(1), 177–186.

Ridley, A. M., & Gudjonsson, G. H. (2012). Suggestibility and Individual Differences. In *Suggestibility in Legal Contexts* (pp. 85–106). John Wiley & Sons, Ltd.

Ridley, A. M. (2013). Suggestibility: a history and introduction. In A. M. Ridley, F. Gabbert & D. J. La Rooy (Eds.), *Suggestibility in legal contexts: psychological research and forensic implications*. Oxford, UK: John Wiley & Sons. 1-19.

Schulz, K. F., Altman, D. G., Moher, D., Barbour, V., Berlin, J. A., Boutron, I., Guyatt, G. (2010). CONSORT 2010 statement: Updated guidelines for reporting parallel group randomised trials (Chinese version). *Journal of Chinese Integrative Medicine*, 8(7).

Scottish Government (2013). Keys To Life: Improving Quality of Life for People with Learning Disabilities. Retrieved from: <http://keystolife.info/wp-content/uploads/2014/05/the-keys-to-life-full-version.pdf>

Sharrock, R., & Gudjonsson, G. H. (1993). Intelligence, previous convictions and interrogative suggestibility: A path analysis of alleged false-confession cases. *British Journal of Clinical Psychology*, 32(2), 169-175.

SIGN (2012) Scottish Intercollegiate Guidelines Network – Methodology Checklists. Retrieved from: <http://www.sign.ac.uk/methodology/checklists.html>.

SØNDENAA, E., Rasmussen, K., Palmstierna, T., & NØTTESTAD, J. A. (2010). The usefulness of assessing suggestibility and compliance in prisoners with unidentified intellectual disabilities. *Scandinavian journal of psychology*, 51(5), 434-438.

Sparrow, S.S., Chichetti, D.V. & Balla, D.A. (2005). Vineland Adaptive Behaviour Scales (2nd ed.). Oxford: Pearson Clinical Assessment.

Sporer, S. L. (1982). A brief history of the psychology of testimony. *Current Psychological Reviews*, 2, 323 – 339.

Taylor, I. (2011). *Fitness to plead and stand trial: The impact of mil intellectual disability*. (Unpublished doctoral thesis). University College London, UK.

Terwee, C. B., Mokkink, L. B., Knol, D. L., Ostelo, R. W. J. G., Bouter, L. M., & De Vet, H. C. W. (2012). Rating the methodological quality in systematic reviews of studies on measurement properties: A scoring system for the COSMIN checklist. *Quality of Life Research*, 21(4), 651–657.

Thistle, J. J. & Wilkinson, K. M. (2013) Working Memory Demands of Aided Augmentative and Alternative Communication for Individuals with Developmental Disabilities. *Augmentative and Alternative Communication*, 29(3), 235-245.

Thorndyke, P. W. (1977). Cognitive structures in comprehension and memory of narrative discourse. *Cognitive psychology*, 9(1), 77-110.

Vredeveltdt, A., Hitch, G. J., & Baddeley, A. D. (2011). Eyeclosure helps memory by reducing cognitive load and enhancing visualisation. *Memory & cognition*, 39(7), 1253-1263.

Weschler, D. (1999) *Weschler Abbreviated Scale of Intelligence Manual*, San Antonio, TX: Harcourt Brace & Company.

Wechsler, D. (2011). *Wechsler Abbreviated Scale of Intelligence - Second Edition*. San Antonio, TX: Pearson.

Wechsler D. (2008). *Wechsler Adult Intelligence Scale - Fourth Edition*. San Antonio, TX: Pearson.

Wechsler (1986). *WAIS-R Manual*. New York: Psychological corporation.

Wechsler, D. (1945). A standardized memory scale for clinical use. *Journal of Psychology*, 19, 87–95

White, R. & Willner, P. (2005). Suggestibility and salience in people with intellectual disabilities: An experimental critique of the Gudjonsson Suggestibility Scale. *The Journal of Forensic Psychiatry & Psychology*, 16(4). 638 – 650.

Willner, P. (2011). Assessment of capacity to participate in court proceedings: a selective critique and some recommendations. *Psychology, Crime & Law*, 17(2), 117-131.

Willner, P. (2008). Clarification of the memory artefact in the assessment of suggestibility. *Journal of Intellectual Disability Research*, 52(4), 318-326.

Woods, D. L., Kishiyama, M. M., Yund, E. W., Herron, T. J., Edwards, B., Poliva, O., Reed, B. (2011). Improving digit span assessment of short-term verbal memory. *Journal of Clinical and Experimental Neuropsychology*, 33(1), 101–111.

World Health Organization. (1992). The ICD-10 classification of mental and behavioural disorders: Clinical descriptions and diagnostic guidelines. Geneva: World Health Organization.

Zigmond, A.S., & Snaith, R.P. (1983). The Hospital Anxiety And Depression Scale. *Acta Psychiatrica Scandinavica*. 67, 361 – 370.

Appendices

Appendix A – Author Guidelines for Journal of Applied Research in Intellectual Disabilities (JARID)

“The journal to which you are submitting your manuscript employs a plagiarism detection system. By submitting your manuscript to this journal you accept that your manuscript may be screened for plagiarism against previously published works.

1. GENERAL

The *Journal of Applied Research in Intellectual Disabilities* is an international, peer-reviewed journal which draws together findings derived from original applied research in intellectual disabilities. The journal is an important forum for the dissemination of ideas to promote valued lifestyles for people with intellectual disabilities. It reports on research from the UK and overseas by authors from all relevant professional disciplines. It is aimed at an international, multi-disciplinary readership.

The topics it covers include community living, quality of life, challenging behaviour, communication, sexuality, medication, ageing, supported employment, family issues, mental health, physical health, autism, economic issues, social networks, staff stress, staff training, epidemiology and service provision. Theoretical papers are also considered provided the implications for therapeutic action or enhancing quality of life are clear. Both quantitative and qualitative methodologies are welcomed. All original and review articles continue to undergo a rigorous, peer-refereeing process.

Please read the instructions below carefully for details on submission of manuscripts, the journal's requirements and standards as well as information concerning the procedure after a manuscript has been accepted for publication. Authors are encouraged to visit <http://authorservices.wiley.com/bauthor/> for further information on the preparation and submission of articles.

All manuscripts must be submitted solely to this journal and not published, in press, or submitted elsewhere.

2. ETHICAL GUIDELINES

Acceptance of papers is based on the understanding that authors have treated research participants with respect and dignity throughout. Please see Section 2.2 below.

2.1 Authorship and Acknowledgements

Authorship: Authors submitting a paper do so on the understanding that the manuscript has been read and approved by all authors and that all authors agree to the submission of the manuscript to the journal. ALL named authors must have made an active contribution to the conception and design and/or analysis and interpretation of the data and/or the drafting of the paper and ALL authors must have critically reviewed its content and have approved the final version submitted for publication. Participation solely in the acquisition of funding or the collection of data does not justify authorship.

It is a requirement that all authors have been accredited as appropriate under submission of the manuscript. Contributors who do not qualify as authors should be mentioned under Acknowledgements.

Acknowledgements: Under Acknowledgements please specify contributors to the article other than the authors accredited. Please also include specifications of the source of funding for the study and any potential conflict of interest if appropriate. Suppliers of materials should be named and their location (town, state/county, country) included.

2.2 Ethical Approvals

Research involving human participants will only be published if such research has been conducted in full accordance with ethical principles, including the World Medical Association Declaration of Helsinki (version, 2002 www.wma.net) and the additional

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All studies using human participants should include an explicit statement in the Material and Methods section identifying the review and ethics committee approval for each study, if applicable. Editors reserve the right to reject papers if there is doubt as to whether appropriate procedures have been used.

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Keywords: Up to six key words to aid indexing should also be provided.

Main Text: All papers should have a structured abstract (maximum 150 words) as follows: Background, Method, Results, and Conclusions. The abstract should provide an outline of the research questions, the design, essential findings and main conclusions of the study. Authors should make use of headings within the main paper as follows: Introduction, Method, Results and Discussion. Subheadings can be used as appropriate. All authors must clearly state their research questions, aims or hypotheses clearly at the end of the Introduction. Figures and Tables should be submitted as a separate file.

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- If you use a table editor function, ensure that each data point is contained within a unique cell, i.e. do not use carriage returns within cells.

Spelling should conform to *The Concise Oxford Dictionary of Current English* and units of measurements, symbols and abbreviations with those in *Units, Symbols and Abbreviations* (1977) published and supplied by the Royal Society of Medicine, 1 Wimpole Street, London W1M 8AE. This specifies the use of S.I. units.

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referencing style, please refer to the APA FAQ. Please note that for journal articles, issue numbers are not included unless each issue in the volume begins with page one.

Journal article

Beers, S. R. , & De Bellis, M. D. (2002). Neuropsychological function in children with maltreatment-related posttraumatic stress disorder. *The American Journal of Psychiatry*, 159, 483–486. doi:10.1176/appi.ajp.159.3.483

Book Edition

Bradley-Johnson, S. (1994). Psychoeducational assessment of students who are visually impaired or blind: Infancy through high school (2nd ed.). Austin, TX: Pro-ed.

6.4 Tables, Figures and Figure Legends

Tables should include only essential data. Each table must be typewritten on a separate sheet and should be numbered consecutively with Arabic numerals, e.g. Table 1, and given a short caption.

Figures should be referred to in the text as Figures using Arabic numbers, e.g. Fig.1, Fig.2 etc, in order of appearance. Figures should be clearly labelled with the name of the first author, and the appropriate number. Each figure should have a separate legend; these should be grouped on a separate page at the end of the manuscript. All symbols and abbreviations should be clearly explained. In the full-text online edition of the journal, figure legends may be truncated in abbreviated links to the full screen version. Therefore, the first 100 characters of any legend should inform the reader of key aspects of the figure.

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Appendix B – Systematic Review: Quality Criteria Guidance

Study Design		
1	Was the sample size sufficient?	<p>(2) Present: Power calculation provided and ≥ 0.8 with $p < 0.05$ or enough info for reader to calculate retrospectively</p> <p>(1) Partial: No mention of appropriateness of sample size but enough info for reader calculation</p> <p>(0) Absent: No power calculation present, and/or and not enough information to calculate. Power obtainable but does not reach 0.8 level.</p>
2	Was the study design appropriate for the research question?	<p>(2) Present: Yes deemed by reader to be optimal</p> <p>(1) Partial: Sufficient but could be better</p> <p>(0) Absent: Inappropriate design – strong likelihood of confounds</p>
3	Was the data useable and missing data described?	<p>(2) Present: Authors report no missing data</p> <p>(1) Partial: Authors report how many participants did not complete/how much unusable data and it was $< 30\%$ of total.</p> <p>(0) Absent: Authors do not comment on or report how many participants did not complete/how much unusable data</p>
4	Were hypotheses regarding correlations or mean differences formulated a priori?	<p>(2) Present: Clearly stated</p> <p>(1) Partial: Partially stated</p> <p>(0) Absent: Not stated clearly/at all</p>
Sample		
5	Was the sample representative of the population? E.g. sampling methods, setting, age range, gender, consider how many invited took part.	<p>(2) Present: Confident in generalisability – multiple setting recruitment, good balance of age, gender etc.</p> <p>(1) Partial: Somewhat representative but not optimal</p> <p>(0) Absent: Very specific population e.g. prison only, not specified.</p>
Measures used		
6	Was a standardised and extensive measure of IQ used?	<p>(2) Present: Full measure of cognitive functioning used, i.e. captures verbal, perceptual, processing and working memory abilities. Uses relevant norms. Good psychometric properties, e.g. WAIS.</p> <p>(1) Partial: Full measure used but prorated. Abbreviated but standardised and well normed measure, e.g. WASI.</p> <p>(0) Absent: Abbreviated or adapted measure used. Or IQ derived from records or < 3 domains, e.g. verbal only as in BPVS. Measure of IQ that has poor psychometric properties e.g. outdated norms for time of study</p>
7	Was a broad range of IQ scores below FSIQ 80 captured?	<p>(2) Present: Broad range and normality of distribution reported, with mean, SD etc. reported</p> <p>(1) Partial: e.g. Only mean reported, i.e. no range, SD.</p> <p>(0) Absent: No IQ scores reported just assumed (e.g. if attend specialist day centre must have $IQ < 80$).</p>

8	How was it established that participant had an ID? (only IQ reported, deficiencies in adaptive functioning stated)	(2) Present: All 3 diagnostic criteria were measured/confirmed and reported by researchers (IQ, adaptive function and onset before 18 years of age). (1) Partial: One or two diagnostic criteria reported. Or all 3 reported but not measured by researchers. (0) Absent: ID assumed – e.g. by association with service.
9	Were known confounding factors measured and accounted for in the analysis? E.g. mood, gender, memory	(2) Present: Thoroughly measured and accounted for (1) Partial: Some mentioned and somewhat accounted for (0) Absent: Not measured. Or measured but not accounted for in analysis
10	Was information provided about administration conditions? i.e. who administered the measures, the environment, instructions given, and was this sufficient.	(2) Present: Information provided. Same administrator and environment (consistency). (1) Partial: In brief, e.g. one area of above (0) Absent: No information provided, or different administrators/environments.
11	Was the administration of the GSS consistent with the manual (fidelity)?	(2) Present: As per manual and reported as such (1) Partial: Suspected or reported unintended deviations from manual/standardised methods (0) Absent: Deviated from standardised measure
12	Were the cognitive variable measures reliable and valid?	(2) Present: Standardised and well-normed measures, good reliability and validity (1) Partial: Compromised in any area above (0) Absent: No standardised measure specific to cognitive variable(s) used
Analysis		
13	Was the statistical analysis appropriate for the study design and collected data?	(2) Present: The analysis is appropriate for the study design and the collected data (1) Partial: Could be better (0) Absent: The analysis used is inappropriate for the study design and/or data
14	Were effect sizes cited and sufficient?	(2) Present: Cited and medium/large, e.g. Pearson's $r \geq$ / correlation coefficient ≥ 0.3 (1) Partial: Cited and small/medium (0) Absent: Not cited or <0.3
Overall Quality		
20-28	High Quality	Most of the criteria are met. Results not likely to change with further research.
10-19	Acceptable	Most of the criteria partially or fully met. Flaws identified in the study. Findings may change with further research.
0-9	Low Quality	Most criteria only partially met or fully unmet. Flaws identified relating to fundamental aspects of study design. Findings likely to change with further research.

Appendix C – Systematic Review: Abstracts excluded during screening process

	Authors	Reason for exclusion
1	Agnew, S. E., & Powell, M. B. (2004). The effect of intellectual disability on children's recall of an event across different question types. <i>Law and Human Behavior</i> , 28(3), 273–294.	Ppts <16 yrs
2	Agnew, S. E., Powell, M. B., & Snow, P. C. (2006). An examination of the questioning styles of police officers and caregivers when interviewing children with intellectual disabilities. <i>Legal and Criminological Psychology</i> , 11(1), 35–53.	Ppts <16 yrs Non-suggestibility
3	Ali, A., Ghosh, S., Strydom, A., & Hassiotis, A. (2016). Prisoners with intellectual disabilities and detention status. Findings from a UK cross sectional study of prisons. <i>Research in Developmental Disabilities</i> , 53–54, 189–197.	Non-suggestibility
4	Antaki, C., Richardson, E., Stokoe, E., & Willott, S. (2015). Can people with intellectual disability resist implications of fault when police question their allegations of sexual assault and rape? <i>Intellectual and Developmental Disabilities</i> , 53(5), 346–357.	Non-suggestibility
5	Beail, N. (2002). Interrogative suggestibility, memory and intellectual disability. <i>Journal of Applied Research in Intellectual Disabilities</i> , 15(2), 129–137.	Non-empirical
6	Bettenay, C., Ridley, A. M., Henry, L. A., & Crane, L. (2014). Cross-examination: The Testimony of Children With and Without Intellectual Disabilities. <i>Applied Cognitive Psychology</i> , 28(2), 204–214.	Ppts <16 yrs Non-suggestibility
7	Blagrove, M. (1996). Effects of length of sleep deprivation on interrogative suggestibility. <i>Journal of Experimental Psychology: Applied</i> , 2(1), 48–59.	Non-ID
8	Bowles, P. V, & Sharman, S. J. (2014). The effect of different types of leading questions on adult eyewitnesses with mild intellectual disabilities. <i>Applied Cognitive Psychology</i> , 28(1), 129–134.	Non-original GSS
9	Brewin, S., & Bailey, A. (2005). Appropriate adults provided for vulnerable people questioned under caution: implications for policy of the Criminal Justice Review in Northern Ireland. <i>The Journal of Adult Protection</i> , 7(1), 4–14.	Non-empirical
10	Brodsky, S. L., & Bennett, A. D. (2005). Psychological assessments of confessions and suggestibility in mentally retarded suspects. <i>Journal of Psychiatry and Law</i> , 33(3),	Non-empirical
11	Brown, D. A., Lewis, C. N., Lamb, M. E., & Stephens, E. (2012). The influences of delay and severity of intellectual disability on event memory in children. <i>Journal of Consulting and Clinical Psychology</i> , 80(5), 829–841.	Ppts <16 yrs

12	Caprin, C., Benedan, L., Ciaccia, D., Mazza, E., Messineo, S., & Piuri, E. (2016). True and false memories in middle childhood: the relationship with cognitive functioning. <i>Psychology, Crime & Law</i> , 22(5), 473-494.	Ppts <16 yrs
13	Ceci, S. J., & Bruck, M. (1993). Suggestibility of the child witness: A historical review and synthesis. <i>Psychological Bulletin</i> , 113(3), 403-439.	Non-empirical
14	Chafetz, M. (2015). Intellectual disability: Civil and criminal forensic issues. <i>Intellectual Disability: Civil and Criminal Forensic Issues</i> . New York, NY, US: Oxford University Press.	Non-empirical
15	Clare, I. C. H. (1993). Issues in the assessment and treatment of male sex offenders with mild learning disabilities. <i>Sexual and Marital Therapy</i> , 8(2), 167-180.	Non-suggestibility
16	Davis, M., Sheidow, A. J., & McCart, M. R. (2015). Reducing recidivism and symptoms in emerging adults with serious mental health conditions and justice system involvement. <i>The journal of behavioral health services & research</i> , 42(2), 172-190.	Non-suggestibility
17	Davis, S. L., & Bottoms, B. L. (2002). Effects of social support on children's eyewitness reports: A test of the underlying mechanism. <i>Law and Human Behavior</i> , 26(2), 185-215.	Ppts <16 yrs Not ID
18	Driscoll, J. H. (2001). Understanding of coercive communications in adolescents with and without developmental or behavior disorders. <i>Dissertation Abstracts International Section A: Humanities and Social Sciences</i> . US: ProQuest Information & Learning.	Non-ID
19	Eisen, M. L., & Lynn, S. J. (2001). Dissociation, memory and suggestibility in adults and children. <i>Applied Cognitive Psychology</i> , 15(7), S49-S73.	Non-empirical
20	Eisen, M. L., Goodman, G. S., Qin, J., Davis, S., & Crayton, J. (2007). Maltreated children's memory: Accuracy, suggestibility, and psychopathology. <i>Developmental Psychology</i> , 43(6), 1275-1294.	Ppts <16 yrs
21	Engle, J., & O'Donohue, W. (2012). Pathways to false allegations of sexual assault. <i>Journal of Forensic Psychology Practice</i> , 12(2), 97-123.	Non-empirical
22	Enns, C. Z., Campbell, J., Courtois, C. A., Gottlieb, M. C., Lese, K. P., Gilbert, M. S., & Forrest, L. (1998). Working with adult clients who may have experienced childhood abuse: Recommendations for assessment and practice. <i>Professional Psychology: Research and Practice</i> , 29(3), 245-256.	Non-empirical
23	Ericson, K. I., & Perlman, N. B. (2001). Knowledge of legal terminology and court proceedings in adults with developmental disabilities. <i>Law and Human Behavior</i> , 25(5), 529-545.	Non-suggestibility
24	Evans, J. R., Schreiber Compo, N., & Russano, M. B. (2009). Intoxicated witnesses and suspects: Procedures and prevalence according to law enforcement. <i>Psychology, Public Policy, and Law</i> , 15(3), 194.	Non-suggestibility Not ID
25	Everington, C., & Fulero, S. M. (1999). Competence to confess: Measuring understanding and suggestibility of defendants with mental retardation. <i>Mental retardation</i> , 37(3), 212-220.	Non-original GSS

26	Fulero, S. M., & Everington, C. (1995). Assessing competency to waive Miranda rights in defendants with mental retardation. <i>Law and Human Behavior</i> , 19(5), 533–543.	Non-suggestibility
27	Freckelton, S. C., & List, D. (2009). Asperger's disorder, criminal responsibility and criminal culpability. <i>Psychiatry, Psychology and Law</i> , 16(1), 16–40.	Non-empirical
28	Gawrylowicz, J., Gabbert, F., Carson, D., Lindsay, W. R., & Hancock, P. J. B. (2013). Face recognition and description abilities in people with mild intellectual disabilities. <i>Journal of Applied Research in Intellectual Disabilities</i> , 26(5), 435–446.	Non-suggestibility
29	Goodman, G. S., Bottoms, B. L., Rudy, L., Davis, S. L., & Schwartz-Kenney, B. M. (2001). Effects of past abuse experiences on children's eyewitness memory. <i>Law and Human Behavior</i> , 25(3), 269–298.	Ppts <16 yrs
30	Grisso, T. (2013). Forensic evaluation of juveniles (2nd ed.). <i>Forensic Evaluation of Juveniles (2nd Ed.)</i> . Sarasota, FL, US: Professional Resource Press/Professional Resource Exchange.	Non-empirical
31	Gudjonsson, G. H. (1983). Suggestibility, intelligence, memory recall and personality: An experimental study. <i>British Journal of Psychiatry</i> , 142, 35–31.	Non-ID
32	Gudjonsson, G. H., & Clare, I. C. (1995). The relationship between confabulation and intellectual ability, memory, interrogative suggestibility and acquiescence. <i>Personality and Individual Differences</i> , 19(3), 333–338.	Non-ID
33	Gudjonsson, G. H., Sigurdsson, J. F., Sigfusdottir, I. D., Asgeirsdottir, B. B., González, R. A., & Young, S. (2016). A national epidemiological study investigating risk factors for police interrogation and false confession among juveniles and young persons. <i>Social Psychiatry and Psychiatric Epidemiology</i> , 51(3), 359–367.	Non - suggestibility Non-ID
34	Gudjonsson, G. H., & Sigurdsson, J. F. (1995). The relationship of confabulation to the memory, intelligence, suggestibility, and personality of juvenile offenders. <i>Nordic Journal of Psychiatry</i> , 49(5), 373–378.	Non-ID
35	Henry, L. (2008). Short-term memory coding in children with intellectual disabilities. <i>American journal on mental retardation</i> , 113(3), 187–200.	Ppts <16 yrs Non-suggestibility Non-ID
36	Henry, L. A. (2010). The episodic buffer in children with intellectual disabilities: An exploratory study. <i>Research in Developmental Disabilities</i> , 31(6), 1609–1614.	Ppts <16 yrs Non-suggestibility
37	Henry, L. A., & Gudjonsson, G. H. (1999). Eyewitness memory and suggestibility in children with mental retardation. <i>American Journal on Mental Retardation</i> , 104(6), 491–508.	Ppts <16 yrs
38	Henry, L. A., & Gudjonsson, G. H. (2004). The effects of memory trace strength on eyewitness recall in children with and without intellectual disabilities. <i>Journal of Experimental Child Psychology</i> , 89(1), 53–71.	Ppts <16 yrs Non-suggestibility
39	Henry, L. A., & Gudjonsson, G. H. (2007). Individual and developmental differences in eyewitness recall and suggestibility	Ppts <16 yrs

	in children with intellectual disabilities. <i>Applied Cognitive Psychology</i> , 21(3), 361-381.	
40	Henry, L. A., & Gudjonsson, G. H. (2003). Eyewitness memory, suggestibility, and repeated recall sessions in children with mild and moderate intellectual disabilities. <i>Law and Human Behavior</i> , 27(5), 481–505.	Ppts <16 yrs
41	Hooper, V.-R., Chou, S., & Browne, K. D. (2016). A systematic review on the relationship between self-esteem and interrogative suggestibility. <i>Journal of Forensic Psychiatry & Psychology</i> , 27(6), 761–785.	Non-empirical
42	Hutcheson, G. D., Baxter, J. S., Telfer, K., & Warden, D. (1995). Child witness statement quality: Question type and errors of omission. <i>Law and Human Behavior</i> , 19(6), 631–648.	Ppts <16 yrs Non-suggestibility
43	Kassin, S. M. (1997). The psychology of confession evidence. <i>American Psychologist</i> , 52(3), 221–233.	Non-empirical
44	Kassin, S. M., Leo, R. A., Meissner, C. A., Richman, K. D., Colwell, L. H., Leach, A.-M., & La Fon, D. (2007). Police interviewing and interrogation: A self-report survey of police practices and beliefs. <i>Law and Human Behavior</i> , 31(4), 381–400.	Non-suggestibility Non-ID
45	Kassin, S. M., Drizin, S. A., Grisso, T., Gudjonsson, G. H., Leo, R. A., & Redlich, A. D. (2010). Police-induced confessions: Risk factors and recommendations. <i>Law and human behavior</i> , 34(1), 3-38.	Non-empirical
46	Lechner, C. M., & Rammstedt, B. (2015). Cognitive ability, acquiescence, and the structure of personality in a sample of older adults. <i>Psychological Assessment</i> , 27(4), 1301–1311.	Non-suggestibility
47	London, K., Henry, L. A., Conradt, T., & Corser, R. (2013). Suggestibility and individual differences in typically developing and intellectually disabled children. <i>Suggestibility in legal contexts: Psychological research and forensic implications</i> , 129-148.	Non-empirical
48	Maras, K. L., & Bowler, D. M. (2014). Eyewitness Testimony in Autism Spectrum Disorder: A Review. <i>Journal of Autism and Developmental Disorders</i> , 44(11), 2682–2697.	Non-empirical
49	Maras, K. L., & Wilcock, R. (2013). Suggestibility in vulnerable groups: Witnesses with intellectual disability, autism spectrum disorder, and older people. <i>Suggestibility in Legal Contexts: Psychological Research and Forensic Implications</i> . Wiley-Blackwell.	Non-empirical
50	Marche, T. A., Brainerd, C. J., & Reyna, V. F. (2010). Distinguishing true from false memories in forensic contexts: Can phenomenology tell us what is real? <i>Applied Cognitive Psychology</i> , 24(8), 1168–1182.	Non-ID
51	Mason, J., & Murphy, G. H. (2002). People with Intellectual Disabilities on Probation: An Initial Study. <i>Journal of Community and Applied Social Psychology</i> , 12(1), 44–55.	Non-suggestibility
52	Mastroberardino, S., & Marucci, F. S. (2013). Interrogative suggestibility: Was it just compliance or a genuine false memory? <i>Legal and Criminological Psychology</i> , 18(2), 274–286.	Non-ID
53	McLachlan, K., Roesch, R., Viljoen, J. L., & Douglas, K. S. (2014). Evaluating the psycholegal abilities of young offenders	Non-suggestibility

	with fetal alcohol spectrum disorder. <i>Law and Human Behavior</i> , 38(1), 10–22.	
54	McLachlan, K., Roesch, R., & Douglas, K. S. (2011). Examining the Role of Interrogative Suggestibility in Miranda Rights Comprehension in Adolescents. <i>Law and Human Behaviour</i> , 35(3), 165–177.	Sample age <16yrs
55	Mercier, C., & Crocker, A. G. (2011). The first critical steps through the criminal justice system for persons with intellectual disabilities. <i>British Journal of Learning Disabilities</i> , 39(2), 130–138.	Non-suggestibility
56	Merckelbach, H., Muris, P., Wessel, I., & van Koppen, P. J. (1998). The Gudjonsson Suggestibility Scale (GSS): Further data on its reliability, validity, and metacognition correlates. <i>Social Behavior and Personality: an international journal</i> , 26(2), 203–209.	Non-ID
57	Miles, K. L., Powell, M. B., Gignac, G. E., & Thomson, D. M. (2007). How well does the Gudjonsson Suggestibility Scale for Children, version 2 predict the recall of false details among children with and without intellectual disabilities? <i>Legal and criminological psychology</i> , 12(2), 217–232.	Ppts <16 yrs
58	Milne, R., Clare, I. C., & Bull, R. (2002). Interrogative suggestibility among witnesses with mild intellectual disabilities: The use of an adaptation of the GSS. <i>Journal of Applied Research in Intellectual Disabilities</i> , 15(1), 8–17.	Non-original GSS
59	Murfett, R., Powell, M. B., & Snow, P. C. (2008). The effect of intellectual disability on the adherence of child witnesses to a “story grammar” framework. <i>Journal of Intellectual and Developmental Disability</i> , 33(1), 2–11.	Ppts <16 yrs
60	Muris, P., Meesters, C., & Merckelbach, H. (2004). Correlates of the Gudjonsson Suggestibility Scale in delinquent adolescents. <i>Psychological Reports</i> , 94, 264–266	Non-ID
61	Najdowski, C. J., & Bottoms, B. L. (2012). Understanding jurors’ judgments in cases involving juvenile defendants: Effects of confession evidence and intellectual disability. <i>Psychology, Public Policy, and Law</i> , 18(2), 297–337.	Non-suggestibility
62	North, A. S., Russell, A. J., & Gudjonsson, G. H. (2008). High functioning autism spectrum disorders: An investigation of psychological vulnerabilities during interrogative interview. <i>The Journal of Forensic Psychiatry & Psychology</i> , 19(3), 323–334.	Non-ID
63	Owen-Kostelnik, J., Reppucci, N. D., & Meyer, J. R. (2006). Testimony and interrogation of minors: Assumptions about maturity and morality. <i>American Psychologist</i> , 61(4), 286–304.	Ppts <16 yrs Non-empirical
64	Perillo, J. T., & Kassin, S. M. (2011). Inside interrogation: The lie, the bluff, and false confessions. <i>Law and Human Behavior</i> , 35(4), 327–337.	Non-suggestibility Non-ID
65	Polczyk, R. (2005). Interrogative suggestibility: Cross-cultural stability of psychometric and correlational properties of the Gudjonsson Suggestibility Scales. <i>Personality and Individual Differences</i> , 38(1), 177–186.	Non-ID
66	Redlich, A. D., & Goodman, G. S. (2003). Taking responsibility for an act not committed: the influence of age and suggestibility. <i>Law and human behavior</i> , 27(2), 141.	Non-ID

67	Richardson, G., & Kelly, T. P. (1994). The relationship between intelligence, memory and interrogative suggestibility in young offenders. <i>Psychology, Crime and Law</i> , 1(4), 283-290.	Non-ID, adolescents only
68	Robinson, J., & McGuire, J. (2006). Suggestibility and children with mild learning disabilities: The use of the cognitive interview. <i>Psychology, Crime & Law</i> , 12(5), 537-556.	Ppts <16 yrs
69	Rogers, R. (2011). Getting it wrong about Miranda rights: false beliefs, impaired reasoning, and professional neglect. <i>American Psychologist</i> , 66(8), 728.	Non-empirical
70	Rogers, R., Harrison, K. S., Rogstad, J. E., LaFortune, K. A., & Hazelwood, L. L. (2010). The role of suggestibility in determinations of Miranda abilities: A study of the Gudjonsson Suggestibility Scales. <i>Law and human behavior</i> , 34(1), 66-78.	Non-ID
71	Rose, C. A., Stormont, M., Wang, Z., Simpson, C. G., Preast, J. L., & Green, A. L. (2015). Bullying and students with disabilities: Examination of disability status and educational placement. <i>School Psychology Review</i> , 44(4), 425-444.	Non-suggestibility
72	Scherr, K. C., & Madon, S. (2012). You have the right to understand: The deleterious effect of stress on suspects' ability to comprehend Miranda. <i>Law and Human Behavior</i> , 36(4), 275-282.	Non-ID Non-empirical
73	Smith, P., & Gudjonsson, G. H. (1995). Confabulation among forensic inpatients and its relationship with memory, suggestibility, compliance, anxiety, and self-esteem. <i>Personality and Individual Differences</i> , 19(4), 517-523.	Non-ID
74	Spivak, B. L., & Thomas, S. D. M. (2013). Police contact with people with an intellectual disability: The Independent Third Person perspective. <i>Journal of Intellectual Disability Research</i> , 57(7), 635-646.	Non-suggestibility
75	Vagni, M., Maiorano, T., Pajardi, D., & Gudjonsson, G. (2015). Immediate and delayed suggestibility among suspected child victims of sexual abuse. <i>Personality and Individual Differences</i> , 79, 129-133.	Ppts <16 yrs
76	Viljoen, J. L., Klaver, J., & Roesch, R. (2005). Legal Decisions of Preadolescent and Adolescent Defendants: Predictors of Confessions, Pleas, Communication with Attorneys, and Appeals. <i>Law and Human Behavior</i> , 29(3), 253-277.	Ppts <16 yrs Non-ID
77	Viljoen, J. L., Roesch, R., & Zapf, P. A. (2002). An examination of the relationship between competency to stand trial, competency to waive interrogation rights, and psychopathology. <i>Law and Human Behavior</i> , 26(5), 481-506.	Non-suggestibility Non-ID
78	Wheeler, J. R., Clare, I. C. H., & Holland, A. J. (2013). Offending by people with intellectual disabilities in community settings: A preliminary examination of contextual factors. <i>Journal of Applied Research in Intellectual Disabilities</i> , 26(5), 370-383.	Non-ID
79	Willner, P. (2011). Assessment of capacity to participate in court proceedings: a selective critique and some recommendations. <i>Psychology, Crime & Law</i> , 17(2), 117-131.	Non-empirical
80	Woolard, J. L., Cleary, H. M. D., Harvell, S. A. S., & Chen, R. (2008). Examining Adolescents' and their Parents' Conceptual and Practical Knowledge of Police Interrogation: A Family Dyad Approach. <i>Journal of Youth and Adolescence</i> , 37(6), 685-698.	Non-suggestibility

81	Young, S., Goodwin, E. J., Sedgwick, O., & Gudjonsson, G. H. (2013). The effectiveness of police custody assessments in identifying suspects with intellectual disabilities and attention deficit hyperactivity disorder. <i>BMC medicine</i> , 11(1), 248.	Non-suggestibility
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Appendix D - Systematic Review: Quality ratings per study

<u>Scoring</u> <i>Present = 2</i> <i>Partial = 1</i> <i>Absent = 0</i>	Cardone & Dent (1996)	Clare & Gudjonsson (1993)	Gudjonsson, Murphy, & Clare (2000)	Gudjonsson & Henry (2003)	O'Connell, Garmoe & Goldstein (2005)	Sharrock & Gudjonsson (1993)	Sondena, Rasmussen, Palmstierna, & Nottestad, (2010)	White & Willner (2005)	Willner (2008)
Was the sample size sufficient?	0	0	0	0	1	0	0	1	1
Was the study design appropriate for the research question?	0	0	0	0	0	0	0	1	0
Was the data useable and missing data described?	2	2	2	2	2	2	1	2	2
Were hypotheses regarding correlations or mean differences formulated a priori?	2	1	0	2	0	2	0	1	0
Was the sample representative of the population?	1	1	1	1	1	1	1	1	1
Was a standardised and extensive measure of IQ used?	1	1	2	1	0	1	1	1	1

Was a broad range of IQ scores below FSIQ 80 captured?	2	2	1	2	0	1	2	1
How was it established that participant had an ID?	1	1	1	1	0	1	1	1
Were known confounding factors measured and accounted for?	0	0	0	0	1	1	0	0
Was information provided about administration conditions?	2	2	2	0	2	0	2	1
Was the administration of the GSS consistent with the manual (fidelity)?	2	2	2	1	2	2	1	1
Where the cognitive variable measures reliable and valid?	0	0	0	0	0	0	0	2
Was the statistical analysis appropriate for the study design and collected data?	1	0	1	1	0	1	0	0
Were effect sizes cited and sufficient?	0	0	0	0	0	0	0	0
TOTAL QUALITY	13	12	11	11	9	12	10	15
<i>0-9: low 10-19: acceptable</i>								11

20-28: <i>high</i>									
Overall quality rating	Acceptable	Acceptable	Acceptable	Acceptable	Low	Acceptable	Acceptable	Acceptable	Acceptable

Appendix E(i) - Empirical Research: Confirmation of Local Approval

Falkirk

approval

Harvey, Nikki

Mon 05/09/2016 11:49

To: SHACKLETON Hannah <s1475240@sms.ed.ac.uk>;

Hi Hannah

Just to say the Chief Social Worker has approved the research to take place. Let me know when you want to make arrangements to meet with my Managers and I will facilitate this. I will be having a Managers Meeting on the 27th of September which if you wanted you could come along for a 30min slot and chat with them and start the ball rolling at that meeting?

Let me know your thoughts

Nikki

Nikki Harvey
Service Manager

Denny Town House
Glasgow Road
FK6 5DL
Tel No: 01324 504134
Email: nikkiharvey@falkirk.gov.uk

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The views and opinions expressed in this e-mail are the senders own and do not necessarily represent the views and opinions of Falkirk Council.

Appendix E(ii) – Empirical Research: Confirmation of Local Approval

Stirling and Clackmannanshire



Hannah Shackleton
Primary Researcher and Trainee Clinical Psychologist
c/o Adult Psychology Dept
NHS Forth Valley
Falkirk Community Hospital
Major's Loan
Falkirk
FK1 5QE

Social Services
Clackmannanshire / Stirling Council
Kilncraigs, Greenside Road
Alloa, FK10 1EB
Tel: 01259 225017
Fax: 01259 225004
Email: vdesouza@clacks.gov.uk
Ref: VDS/SSLD
Date: 31 May 2016

Dear Hannah

RESEARCH ACCESS

Thank you for your research access request. We are grateful for the submission of the information requested and we have reviewed your documentation. We are now in a position to approve your request.

To progress this further, please contact Heather Fleming, Day Support Team Manager at your earliest convenience:

flemingh@stirling.gov.uk
01786 237962

At the conclusion of your research we ask that you please provide the service with a summary of your findings. Please forward this to ssld@stirling.gov.uk.

We wish you well with your research.

Yours sincerely

A handwritten signature in black ink that reads 'Val de Souza'.

Val de Souza
Head of Shared Social Services/CSWO
Clackmannanshire and Stirling Councils

c.c. Social Services Learning & Development

Appendix E(iii) - Empirical Research: Confirmation of Local Approval

Dundee and Angus College

Re: research request / inquiry

Shona Pickering

Wed 31/08/2016 15:57

To: SHACKLETON Hannah <s1475240@sms.ed.ac.uk>;

Hi Hannah

I was just thinking that I must get in touch with you. We are happy to get involved in your project.

Probably best to arrange another phone call and we can discuss dates and times etc. At the moment the best day of the week is a Friday morning 8.30 - 9.30.

I can't do this week however but Friday 9th looks ok.

Just let me know

Thanks

Shona

Academic Head

Supported Education

Dundee and Angus College

Appendix E(iv) - Empirical Research: Confirmation of Local Approval

Fife Council

RE: Data Sharing Privacy Impact Assessment Checklist form - Hannah Shackleton

Karen Welsh

Thu 15/09/2016 13:33

To: SHACKLETON Hannah <s1475240@sms.ed.ac.uk>;

Afternoon Hannah,

I have now spoken to our Health & Social Care Service and Ian Wilson has confirmed he is happy for you to get in touch with him to arrange setting this up.

Ian's contact details are as follows:

Ian Wilson,
Service Manager (Resources)
Health & Social Care,
5th Floor North,
Rothesay House,
GLENROTHES,
Fife,
KY7 5PQ.

Telephone 03451 55 55 55 Ext. 446899

E-Mail: ian.wilson@fife.gov.uk

If you need help with anything else, please don't hesitate to get in touch.

Regards.

Karen.

Karen Welsh
Data Protection Officer

Fife Council
Business Technology Solutions,
Finance and Corporate Services,
Fife House,
North Street,
Glenrothes
KY7 5LT.

Tel: 03451 55 55 55. After the message enter ext **443078**.

E-Mail: karen.welsh@fife.gov.uk



Asking the Right Questions: Does it matter how we ask?

PARTICIPANT INFORMATION SHEET



Please read this information sheet. You can ask someone else, like a family member or support worker to help you.



My name is Hannah. I am at University. I am learning to be a Psychologist.

I am doing some research as part of my University work.



What is the research about?

I want to find out whether the way that someone asks a question changes the answer that people give. We hope that this research will help us better understand how to ask questions fairly, especially for those people with a learning disability.

Why have you asked me to take part?

We are asking people with learning disabilities if they would like to help with this research.

Asking the Right Questions: Does it matter how we ask?

PARTICIPANT INFORMATION SHEET

Do I have to take part?

No. It is your decision whether you want to take part or not.



You can change your mind about taking part, even if you have already started the study. It is also okay to change your mind later on if you decide you don't want to take part. You don't have to say why you don't want to take part.

How do I let you know that I want to take part?



If you want to take part, you can fill in the reply sheet and give it to me or your support worker. You can also phone or email me. You can ask somebody to help you.

What will happen if I take part?

I will contact you and meet you to tell you more about the study. If you decide that you want to take part, I will ask you to sign a form.



I will meet with you for about an hour and a half. I will ask you some questions about yourself. I will also read you two stories and ask you some

Asking the Right Questions: Does it matter how we ask?

PARTICIPANT INFORMATION SHEET

questions about them. One story is about a robbery and the other is about an accident.



I will also ask you to do some puzzles. You can have a break if you need to. If you prefer, you can also ask to have someone else there with you too.

When I have finished asking you questions, there will be a chance for you to ask questions if you want. After this, I will thank you and the meeting will be finished.

If any part of the study makes you feel upset for any reason, you can tell the following people who will support you:

- Me
- A member of your staff
- Your GP

Will other people find out about what I say?



The answers you give to the questions will be private. This means that your answers will be written down, but your name will not be there so no one will know they are yours.

Asking the Right Questions: Does it matter how we ask?

PARTICIPANT INFORMATION SHEET



The only time that I might have to tell someone else about what you have said is if I think that you may be at risk. This will only happen if I am very worried about you or someone else. If this does happen, I will tell you first.



Is the research safe to do?

All research has to be checked by a special team of professionals to make sure it is safe to do. This team is called an ethics committee. The ethics committee from the University of Edinburgh have looked at this research and decided that it is ok to do.

What happens to the answers I give you?

Your answers will be put with everyone else's and will be studied to get the answer to the research question. I will write about what I find out from the research. Other people will be able to read this, but they won't know that you have taken part.

How can I find out about the research results?

Asking the Right Questions: Does it matter how we ask?

PARTICIPANT INFORMATION SHEET



If you want to know the results of the research please tell me. I will send you this information when the research has finished.

Please keep this information sheet. You will also be given a copy of your consent form if you decide to take part.

Thank you for reading this information and thinking about taking part in this research.



You can ask me questions about this research. You can write to me or phone me. You can ask somebody else to do this with you.

Asking the Right Questions: Does it matter how we ask?

PARTICIPANT INFORMATION SHEET

Miss Hannah Shackleton

Primary Researcher
and Trainee Clinical Psychologist

c/o Adult Psychology Dept
NHS Forth Valley
Falkirk Community Hospital
Major's Loan, Falkirk. FK1 5QE

QuestionsAndAnswersResearch@gmail.com

Ph. 01324 614347

Or:

Ken MacMahon
Senior Lecturer and Clinical Psychologist
University of Edinburgh
Health in Social Science
Old Medical School
EH8 9AG
Ph. 0131 651 3969



If you want to talk to someone else who knows about the study but is not involved with it, please contact:

Angus Macbeth
Lecturer and Clinical Psychologist
University of Edinburgh
Health in Social Science
Old Medical School
EH8 9AG
Ph. 0131 651 3960



Asking the Right Questions: Does it matter how we ask?

PARTICIPANT INFORMATION SHEET

I would like to find out more about this research.

My name is:.....

The best way of getting in touch with me is:

Telephone number:

E-mail address:

or speaking to:

Please give this sheet to your key worker/care manager/lecturer.

This is so the researcher will know it's okay to contact you and will be in touch soon.



Asking the Right Questions: Does it matter how we ask?

PARTICIPANT CONSENT FORM

Before you decide to take part in this study, we need to check you understand what the study is about, and what it involves.

Please read the following, and IF YOU AGREE, add your initials to the box:

	INITIALS
I have been given information about this study	
I understand what this study is about	
All of my questions about the study have been answered	
I have had a chance to talk to someone else, like a friend, staff or family member about whether I should take part in the study	
I understand that I can say 'no' to taking part at any time	
I understand that I don't have to say why I don't want to take part	
I know that nobody will know that the information I have given is from me	

Asking the Right Questions: Does it matter how we ask?

PARTICIPANT CONSENT FORM

I agree to take part in this research study:

Signature:	
Name:	
Today's date:	
Researcher's signature:	

Appendix F(iii) - Empirical Research: Situational anxiety measure



Asking the Right Questions: Does it matter how we ask?

Situational anxiety measure (completed by researcher with participant)

Participant number:

Since we have met today...	
I felt tense	
I felt frightened, as if something bad is about to happen	
I felt worried	
I felt relaxed	
I had a funny feeling in my tummy, like butterflies	
I felt fidgety	
I felt panicky	

Visual representation of quantity to be displayed to participants:

Not at all / A little bit / Quite a lot / Very much





Asking the Right Questions: Does it matter how we ask?

INFORMATION SHEET

Who is doing the research?

The research is being carried out by myself, Hannah Shackleton, Trainee Clinical Psychologist, as part of my qualification of Doctorate in Clinical Psychology at the University of Edinburgh. Dr Ken MacMahon, Clinical Psychologist and Senior University Lecturer, and Dr Edith Matheson, Clinical Psychologist, will supervise the research.

Who are we recruiting?

We are looking to recruit individuals with:

- Mild learning disability (IQ 50 – 69)
- Aged 16 or over

With the exclusion of those who have:

- A major mental illness, e.g. diagnosis of schizophrenia, current severe depression
- Dementia, or current query of dementia
- Current substance misuse
- Current involvement with forensic services
- Previous engagement with primary researcher (Hannah Shackleton) in a therapeutic setting

What is the study about?

Research has found that the way that questions are asked can affect the answers that a person gives. Some people may be particularly vulnerable to changing their answers or agreeing with questions, depending on how they are phrased. Researchers have suggested that people with intellectual disabilities can be more susceptible to this than people who don't have intellectual disabilities. A scale (which involves a story being read to a person) is often used to measure the extent to which a person might be influenced in this way. However, there are concerns that the scale can over-estimate this tendency in people with intellectual disabilities.

This study aims to adapt this scale, using pictures, to support people's performance on the assessment, in order to find out whether it is possible to improve this measure. Assessments of people's memory skills, general ability and how anxious they are will also be taken, to check whether these affect performance on the scale.

Why is this study important?

This study aims to find out whether an adapted version of the existing scale would be a useful way of measuring people's tendencies to agree with others.



Asking the Right Questions: Does it matter how we ask?

INFORMATION SHEET

This research could also have implications for practice, since the current scale is often used with people with intellectual disability; yet there are on-going concerns about how useful it actually is in its present form.

This thesis is also being carried out as part of the Doctorate of Clinical Psychology and therefore has training and educational value.

What will happen in the study?

Participants will be recruited from learning disability services (non-NHS) across communities within Forth Valley. Recruitment may also take place in other areas, such as Glasgow and Edinburgh. If you give permission for the research to be carried out in your service / college *[will be amended to suit each service]*, I would like to approach the keyworkers and / or care managers and ask them to identify groups of service users / students *[will be amended to suit each service]* who may meet inclusion criteria. A short presentation regarding the study would be given to groups of potential participants. Information packs would be left with the group, and they would indicate their interest in taking part by filling-out a reply slip (to send back to me, or to be collected from your service), or by contacting me by phone or e-mail. This method of approaching and recruiting potential participants is commonly used when people with a learning disability are involved in research.

When a potential participant has responded, I will make an appointment time to meet with them in order to explain the study and talk through the Participant Information Sheet. The Participant Information Sheet has been reviewed by a learning disability Speech and Language Therapist as being broadly suitable for people with mild learning disabilities. The participant will be allowed to take the information away to consider and will be approached again after at least 24 hours to see if they are willing to participate.

If they are, a suitable time will be made to meet with participants again. The participant will again be told about the study, and their rights to choose to take part or not, as well as their rights to withdraw at any time. If they consent, I will then ask them to sign a consent form before starting the study with them.

Both the original and the adapted versions of the measure will be administered, along with some cognitive ability measures and an anxiety measure. Some basic demographic information will also be recorded, such as age, gender and living arrangements (e.g., with or without support). These details will be anonymised when they are combined with the other data, in order to maintain confidentiality.

Asking the Right Questions: Does it matter how we ask?

INFORMATION SHEET

The participants' responses will be anonymous and the administration should last between 1-2 hours in total, depending on level of ability. Participants will be given the opportunity to receive further information about the results of the research, should they wish.

Do they have to take part?

Participation in this research is entirely voluntary. There will be no consequences should either the individual or the service choose not to participate. The individual will be reminded that they can withdraw at any time and without giving a reason.

Could anything in the research process cause any distress?

Although there does not appear to have been any concerns raised in previous research using the scale with individuals with an intellectual disability, there is a small risk that distress may result from the events depicted (the stories describe a woman having her handbag stolen, and a child losing control when riding their bicycle). It will be the researcher's responsibility to identify if the participant becomes distressed or upset during the session and the study would stop at that point. The researcher would check, sensitively, whether there are reasons for any distress, and direct the participant to identify appropriate support from others, such as a member of staff or their GP.

Who has reviewed the project?

The project has been reviewed and approved by the University of Edinburgh Health in Social Science Research Ethics Committee.

What will happen to the results of the project?

This study will be written up as part of my qualification of Doctorate in Clinical Psychology at the University of Edinburgh, and may also be written up in a Psychology journal. If you wish, it is possible for me to send you a written summary of the results following completion of the research. Please let me know if this is the case. An additional accessible summary of the results will be offered to all participants.

Risk management

Should information be disclosed regarding any risk of harm to the participant or risk of harm to others, this shall be managed with clinical judgment and with sensitivity. The duty to disclose such information will be made clear to the participant, both on the information sheet and verbally when consent is taken. Any issues in relation to this will be discussed with research supervisors and

Asking the Right Questions: Does it matter how we ask?

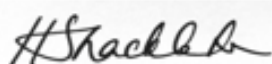
INFORMATION SHEET

appropriate steps will be taken to safeguard individuals. It is the researcher's responsibility to manage disclosures appropriately, e.g. the welfare of the individual will be paramount, and appropriate authorities will be informed.

How can I find out more?

Please find the research team's contact details at the end of this information sheet. We will be happy to answer any questions you may have regarding this research.

Thank you for taking the time to read this information and for considering this research.



Hannah Shackleton
Primary Researcher
and Trainee Clinical Psychologist

c/o Adult Psychology Dept
NHS Forth Valley
Falkirk Community Hospital
Major's Loan, Falkirk. FK1 5QE



QuestionsAndAnswersResearch@gmail.com

Ph. 01324 614347

Or:

Ken MacMahon
Senior Lecturer and Clinical
Psychologist
University of Edinburgh
Health in Social Science
Old Medical School
EH8 9AG
Ph. 0131 651 3969

If you want to talk to someone else who knows about the study but is not involved with it, please contact:

Angus Macbeth
Lecturer and Clinical Psychologist
University of Edinburgh
Health in Social Science
Old Medical School
EH8 9AG
Ph. 0131 651 3960

Appendix H - Empirical Research: Participants demographics form



Asking the Right Questions: Does it matter how we ask?

Demographic information

(completed by researcher with participant)

Participant number:

AGE:		
GENDER:	Male Female	
MARITAL STATUS:	Married Divorced Widowed Separated	A member of an unmarried couple Other.....
ACCOMMODATION:	Live alone Live with family Cohabiting Shared house (with supported living) Other.....	
MAIN CARER	None Parent Support worker/carers	
EMPLOYMENT	Paid employment Voluntary employment Unemployed A student (Full time / part time)	Retired Unable to work Other.....

Appendix I(i) - Empirical Research: Permissions for use of Boardmaker images

RE: None #333 [ref:_00Dw0Csat._500w016Hvsw:ref]

noreply@salesforce.com [noreply@salesforce.com] on behalf of mjq@tobiidynavox.com
[mjq@tobiidynavox.com]

Sent: 02 February 2016 19:53

To: Shackleton Hannah (NHS FORTH VALLEY)

Cc: PCSLicensing@tobiidynavox.com

Hello Hannah,

Please use up to 250 PCS with our permission. Please ensure that an updated copyright statement is included:

The Picture Communication Symbols ©1981–2015 by Mayer-Johnson LLC. All Rights Reserved Worldwide. Used with permission.

Thanks!

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Pittsburgh, PA 15203

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Fax: 1-866-585-6260

Web: www.tobiidynavox.com

----- Original Message -----

From: Alicia Trax [alicia.trax@tobiidynavox.com]

Sent: 2/1/2016 2:43 PM

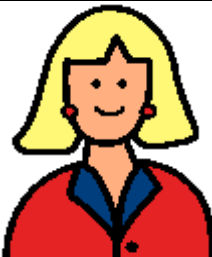



To: mjq@tobiidynavox.com

Subject: None #333

Contact Person *	Hannah Shackleton
Company Name *	NHS Forth Valley / University of Edinburgh
Address *	Adult Clinical Psychology, Falkirk Community Hospital Major's Loan Falkirk FK15QE United Kingdom
Phone *	00447783406622
Email *	hannah.shackleton@nhs.net
Description	Trainee Clinical Psychologist conducting research in the Forth Valley region of the National Health Service of Scotland.
What is the purpose of the product?	The purpose of the product is to facilitate the comprehensibility of materials involved in a research project that is recruiting individuals from the population of mild intellectual disability. The materials that will be

	adapted for use with those with a mild intellectual disability will include the participation sheets, the consent form, and an experimental measure used within the study.
What is the intended audience/market?	Individuals with mild intellectual disability.
How are symbols used in your product?	For adapting the participant information sheet and consent forms. Symbols will also be desirable for the adaptation of a measure used within the experimental session.
Is the product dependent on the use of symbols?	As the materials involved in this research are intended for use by those with a mild intellectual disability, the use of symbols is desirable.
What percentage of the product is made up of symbols?	Approximately 10 symbols each on the participant information sheet and consent form, and no more than 80 symbols on the adapted measure in total.
Do you intend to sell or give away your product?	No, for this current research there is no monetary value of the 'products', it is purely for research use only.
If you intend to sell, what is the anticipated retail price for your product?	
How many copies of your product do you expect to produce annually?	The adapted materials are for a one-off project. It is estimated that only one copy of each set of materials will be required per person, totally approximately 90 sets.

Appendix I(ii) - Empirical Research: Adapted GSS scales and questions





GSS 1 (part a)	
Story	Visual supplement
1. Anna Thompson	
2. of South Croydon	
3. Was on holiday in Spain	
4. With her husband	
5. When her bag was stolen	
6. Which had £50 worth of travellers cheques and her passport inside	
7. She screamed for help	
8. And tried to fight back	
9. By kicking one of the robbers in the leg	



10. A police car arrived quickly	
11. And the woman was taken to the nearest police station	
12. Where she was interviewed by Detective Sergeant Delgado.	

GSS 1 (part a) questions (leading questions are emboldened)

1. Was the woman interviewed by a Detective Sergeant?
2. Was the woman on holiday with her husband?
3. **Did the woman's glasses break in the struggle? (L)**
4. **Was the woman's name Anna Wilkinson? (L)**
5. **Was the woman taken to the central police station? (L)**
6. **Did the woman's handbag get damaged in the struggle? (L)**
7. Was the woman on holiday in Spain?
8. Was the woman from South Croydon?
9. **Did the woman's clothes get torn in the struggle? (L)**
10. **Did the woman hit one of the robbers with her fist or handbag? (L)**
11. **Did one of the robbers shout at the woman? (L)**

GSS 1 (part b)





Story	Visual supplement
13. The woman reported that the 3 men had robbed her	
14. The men were slim and in their early twenties	
15. One of the men was bald	
16. The police officer felt sorry for the woman and told her to contact the British embassy	
17. Six days later	
18. The police found the woman's handbag	
19. But there was no money or passport	
20. Three men were then charged	

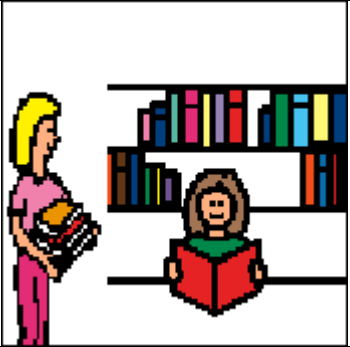
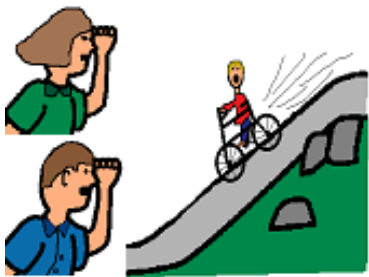
21. two of the men were convicted and went to prison	
22. one of them had stolen a bag before	
23. the woman returned to Britain with her husband Simon and two friends	
24. but was still frightened of being on her own.	

GSS 1 (part b) questions (leading questions are emboldened)

1. Did the woman have a husband called Simon?
2. Was one of the robbers bald?
3. **Did the police give the woman a lift back to her hotel? (L)**
4. **Did the woman have one or two children? (L)**
5. **Were the robbers black or white? (L)**
6. **Were the robbers convicted six weeks after their arrest? (L)**
7. Did two of the men go to prison?
8. Were the contents of the handbag ever found?
9. **Did the woman's husband support her during the police interview? (L)**
10. **Were the robbers tall or short? (L)**
11. **Did the woman return to America after her holiday? (L)**

GSS 2 (part a)



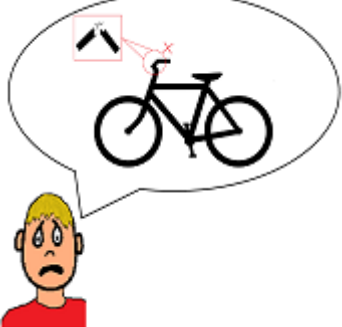

Story	Visual supplement
1. Anna and John were a happily married couple in their thirties	
2. They had three children, two boys and a girl	
3. The two boys were twins	
4. They lived in a small bungalow	
5. Which had a swimming pool in the garden	
6. John worked in a bank	



7. Anna worked in a bookshop with her sister Maria	
8. One Tuesday morning in July	
9. The couple were leaving their house to go to work	
10. They saw a small boy	
11. Going down a steep slope	
12. On a bicycle	

GSS 2 (part a) questions (leading questions are emboldened)

1. Were the couple called Anna and John?
2. Were their two boys twins?
3. **Did the couple have a dog or a cat? (L)**
4. **Did the boy on the bicycle pass a stop sign or traffic lights? (L)**
5. **Did the boys bicycle get damaged when it fell on the ground? (L)**
6. **Was the husband a bank director? (L)**
7. Did the couple live in a small bungalow?
8. Was the boy's name William?
9. **Was the boy frightened of a big van coming up the hill? (L)**
10. **Did the boy have some minor bruises as a result of the accident? (L)**
11. **Did the boy drop the books he was carrying whilst riding the bicycle? (L)**

GSS 2 (part b)

Story	Visual supplement
13. The small boy on the bicycle was calling for help	
14. He was ringing his bell	
15. Anna and John ran after the boy	
16. John caught hold of the bicycle and made it stop	
17. The boy appeared very frightened but unhurt	
18. And said that the brakes on his bicycle had broken	
19. Anna and John recognised the boy	
20. Whose name was William	
21. He was the youngest son of their neighbours	
22. Who worked for a well-known travel agency in a nearby town.	

<p>23. Sometimes in the winter months the two couples had gone skiing together</p>	
<p>24. But the children had preferred to stay with their grandparents who lived in the country.</p>	

GSS 2 (part b) questions (leading questions are emboldened)

1. Was the boy on the bicycle calling for help?
2. Was the boy on the bicycle ringing the bell?
3. **Anna worried that the boy might be injured? (L)**
4. **Did John grab the boys arm or shoulder? (L)**
5. **Did the boy commonly ride his bicycle to school? (L)**
6. **Was the boy taken home by Anna or John? (L)**
7. Was the boy's name William?
8. Did their parents go skiing together sometimes?
9. **Was the boy frightened of riding his bicycle again? (L)**
10. **Was the boy allowed to stay away from school after the accident? (L)**
11. **Was the weather wet or dry when the accident happened? (L)**

Appendix J - Empirical Research: Debrief wording

“As we said at the beginning of this research, we are interested in whether the way that someone asks you a question changes the answer you give. That is why we asked you to answer the questions about the story a second time after telling you that you made some mistakes. We were interested in whether the answers you gave changed after we said this. You may or may not have made any mistakes when you were answering those questions.”

Appendix K - Empirical Research: University Research Proposal



Doctorate in Clinical Psychology

Thesis Research Proposal (for Research 1 assessment).

Provisional Thesis Title: The measurement of suggestibility in adults with intellectual disabilities: Adapattion of the Gudjonsson Suggestibility Scales and an exploration of the influence of cognitive variables.

Exam number: B066836

Allocated Thesis Project Supervisors

Clinical:	Dr Edith Matheson
Academic:	Dr Ken MacMahon

Proposed setting(s): Non-NHS community services, e.g. day centres, social clubs and college courses for students with additional needs. It is proposed that recruitment will focus upon Forth Valley in the first instance, but will extend to other areas of Scotland if necessary.

Anticipated Month & Year of Submission of Thesis: 1st May 2017

Version (date): 11th July 2015

Total word count (exl. references): 5,996

Introduction

1) Please provide a brief critical review of relevant literature, which should clearly demonstrate the rationale and scientific justification for the research. (Relevant to IRAS A12)

Suggestibility

An individual may be described as 'suggestible' when found to be likely to accept and/or behave under the influence of others' suggestion. The concept of suggestibility has been in circulation within the field of psychology for well over a century. Whilst very early literature often related to hypnosis (see Ridley, 2013, for a review), suggestibility was later explored in relation to event recollection. Cattell, in the late 19th century, carried out some of the earliest experimental research in this area, highlighting the effects of suggestion upon testimony (Sporer, 1982). This research was later extended by Loftus, who looked more specifically at the impact that wording has on the distortion of memory (Loftus & Palmer, 1974), contributing to the then developing theory of interrogative suggestibility – the degree to which a person is susceptible to suggestive questioning. Research from this era identified two main ways that suggestibility can be affected during questioning: by the use of suggestive or leading questions, and the influence of criticism or negative feedback (Gudjonsson, 1987).

Prompted by concern regarding the credibility of witness statements, and the fact that individuals may be influenced into making false statements, researchers began to focus on the measurement of suggestibility. Indeed, the relevance of suggestibility is not confined to forensic contexts. Any form of clinical interview where information is gathered, may be subject to the influence of leading questioning, and to the susceptibility of individuals to such questioning. In an attempt to quantify the degree to which an individual may be suggestible under interview, Gudjonsson (1984) developed a scale that was intended to measure this concept. The Gudjonsson Suggestibility Scale (GSS1) involves a recollection and interrogation of a fictional story that is read to an individual. Gudjonsson later developed a second version of this scale, the Gudjonsson Suggestibility Scale 2 (GSS2) that highly correlates with the GSS1 (Gudjonsson, 1987). Three scores are obtained from these scales; yield, shift and total suggestibility. 'Yield' refers to how much an individual can be influenced by leading questions, whilst 'shift' refers to the extent to which an individual sways or changes their answers when critical feedback regarding their initial response is given. An individual's total suggestibility score is the sum of the individual's first yield score and shift score.

Numerous studies have found associations between Gudjonsson's scales and specific psychological variables that would be expected to influence the degree to which a person might be suggestible in a given situation. These include anxiety levels of the participant (Wolfradt & Meyer, 1998), self-esteem (Drake *et al.*, 2008; Gudjonsson & Lister, 1984) social desirability (Richardson & Kelly, 2004) experiences of life adversity (Drake & Bull, 2011). Given this, the scales

have become widely used tools for the assessment of suggestibility of witnesses, including both victims and alleged perpetrators.

The Use of the Gudjonsson Suggestibility Scales with People with Intellectual Disabilities

The GSS1 and GSS2 are used frequently as an index of suggestibility for individuals with intellectual impairment who come into contact with the criminal justice system, either as victims or alleged perpetrators (Howells & Ward, 1994; Bowden, 1998). Despite this, it has received a number of criticisms since its inception in the early 1980's. Researchers have critiqued the scales for only using verbal information, particularly when most human testimony and lived experiences involve encoding of visually perceived information (Beail, 2002; White & Willner, 2005). Beail (2002) argued that the scales are more likely to elicit acquiescent responses from individuals who are firmly encouraged to answer questions on information they often have difficulty recalling in the first place (e.g. fictional events). Beail (2002) also cautions to the use of semantic memory as opposed to autobiographical memory, the latter of which would more likely be the memory used to store information about an event witnessed.

Such authors highlight that the scales (GSS1 and GSS2) appear to rely on verbal memory ability, instead of providing a true sense of how suggestible an individual is. Indeed, White and Willner (2005) found that the scales overestimated suggestibility in comparison to 'real-life' events, when a similar paradigm to the GSS was employed. Hence, those with verbal memory difficulties could seem highly suggestible as a result of their memory capabilities, rather than as an indication that they are inherently 'suggestible'. In an attempt to explore whether this indeed was the case, Cardone & Dent (1996) added visual information in the form of pictures to the scales, and administered this to a group of individuals with intellectual disabilities. They found that, when compared to individuals only receiving verbal information, the degree to which a person 'yielded' to leading questions was reduced significantly. However, scores with this adaptation were still higher than scores found amongst people without such disabilities, and the extent of information recalled was still close to floor level. This suggests that cognitive ability was still playing a significant role, even with this adaptation. In addition, Cardone & Dent (1996) did not use visuals for every component of information presented (only 17 of a potential 40), which may only partially benefit the individual. Similarly, a study by Bowden (1998) adapted the scale to include a video along with the verbal information. Whilst there was no expected improvement in suggestibility scores, it must be considered whether the visual information needs to be present for a certain amount of time so as to be encoded sufficiently by the participant, and thus reduce the effects of reduced memory ability. As such, it would be reasonable to think that having a visual adaptation may only be useful if there is enough of it, and it is present for long enough to be encoded by the participant.

When Willner (2008) amended the administration of the scales to ask for recall of information halfway through the 'story', he found that whilst recall was improved, suggestibility did not decrease as would be expected. It is possible that this finding is the result of Willner (2008) not using visual aids to support recall. It is well recognised that the use of visual materials can support the understanding and decision-making of individuals with intellectual disabilities (Bailey, Willner & Dymond, 2011). Hence, this may explain why Willner (2008) did not find that reducing verbal memory load reduced suggestibility on this paradigm.

It has also been suggested that scores on the scales are likely to be influenced by the vocabulary level of the individual. For this reason a reliance on verbal information maybe particularly problematic for individuals with impaired cognitive functioning, such as those with intellectual disabilities who are likely to have lower vocabulary ability (Bryant *et al.*, 2003). Thus, some authors have argued, strongly, that the scales should not be used with individuals with impaired cognitive function, such as those with an intellectual disability (Willner, 2011). However, at present, there is not a similar assessment that could be used with people with intellectual disabilities, a group for whom the question of suggestibility is most likely to arise.

In conclusion

At present, there appears to be an impasse with regard to the use of the scales for people with intellectual disabilities, for whom the assessment of suggestibility is often a crucial issue within forensic settings. Within the wider population, where verbal memory ability is far less likely to be a factor, the scales appear to measure factors that would be considered psychological in nature (such as self-esteem; Drake *et al.*, 2008). However, within an intellectual disability context, cognitive factors, particularly verbal memory, appear to be the overwhelming contributor to suggestibility when using this measure.

Nonetheless, the availability of a measure of suggestibility for use with people with intellectual disabilities, across both forensic and clinical settings, continues to be of value. Yet, the scale in its present form appears to rely too heavily on cognitive abilities. Until it is possible to reduce the loading on these abilities, and demonstrate that suggestibility on this paradigm is not merely an artefact of memory ability in a given situation, the scales will continue to be vulnerable to considerable criticism. Given this, it appears necessary to consider whether it is possible to modify the scales further and demonstrate that it is not entirely reliant on cognitive abilities in a given situation. If this is possible, then further exploration with the GSS paradigm would be of value.

In order to establish whether the GSS paradigm could be taken forward, this study proposes to focus on the addition of visual materials to a reduced scale. Indications from a previous study (Cardone & Dent, 1996) suggest that reducing memory load may reduce suggestibility (as indexed by the scales).

Nonetheless, recall of information remained low and hence subject to floor effects, possibly due to visual stimuli not being used for each item of information. Furthermore, reducing the number of items on the scale (without visual aids) did not alter the suggestibility score, a somewhat surprising finding (Willner, 2008).

Thus far, the reduction of verbal load in addition to augmentation with verbal stimuli has not been examined. By making these adaptations to the existing scale, it is anticipated that the risk of floor effects will be reduced. Within the proposed study, measures of general intellectual ability and verbal and visual memory will be taken. This will provide information regarding what cognitive capabilities are supported by the addition of visual materials. A measure of situational anxiety will also be taken as it has been shown that suggestibility in a given situation can be mediated by anxiety (Hansdottir *et al.*, 1990). This will give the opportunity to determine whether it is possible to utilise an augmented format of the scale for future work on suggestibility, and potentially a measure specific to people with intellectual disabilities, and to what degree individual differences on this assessment remain as artefacts of cognitive processing abilities.

Research Questions / Objectives:

2) What is the principal research question / objective? (IRAS A10)

i) Will the addition of visual materials to adapted Gudjonsson Suggestibility Scales reduce suggestibility?

3) What are the secondary research questions? (IRAS A11)

ii) Will the degree to which suggestibility is reduced be dependent upon the cognitive variables of IQ and visual and auditory memory?

Methodology

4) Please give a full summary of your design and methodology. (Relevant to IRAS A13)

Ethics opinion

An application for ethical approval will be made through the University of Edinburgh School of Health in Social Science Research Ethics Committee. It is not envisaged that an application will have to be made through the NHS Research Ethics process, as participants will not be NHS patients nor recruited through NHS services. Approval

from relevant Local ethics committees will be obtained as necessary, e.g. local councils.

Design

The research questions will be addressed using quantitative methods, using a within-subjects counterbalanced experimental design.

Each participant will complete both 'verbal' and 'verbal + visual' versions of the suggestibility scales, but counterbalancing will be used to account for order effects. Both parallel versions of the scales (the GSS1 and GSS2) will be used for re-administration purposes, and visual materials will be developed for each. This results in four different streams of presentation order, which are as follows:

- Order 1: GSS1 (first half) - verbal only / GSS2 (first half) - verbal & pictures
- Order 2: GSS2 (first half) - verbal only / GSS1 (first half) - verbal & pictures
- Order 3: GSS1 (first half) - verbal & pictures / GSS2 (first half) - verbal only
- Order 4: GSS2 (first half) - verbal & pictures / GSS1 (first half) - verbal only

Participants will be sequentially allocated to one of these conditions and complete the measures in the above order. At data analysis stage, comparisons between recall and suggestibility scores will be made for the GSS1 and GSS2 (both adapted).

Stage 1: Materials Development

Following the adaptation of the GSS1 and GSS2 (halved in length and visual stimuli [pictures] developed, [see Section 6]), the scale will be reviewed by a group of five individuals working within intellectual disability services. This will serve as a check that the pictures match the verbal content of the scale (as per Cardone & Dent, 1996).

A Speech and Language Therapist working in the area of intellectual disabilities will also review all materials such as Information Sheets and Consent Forms to ensure they are accessible for those with a mild intellectual disability.

Stage 2: Recruitment

The initial wave of recruitment will be throughout NHS Forth Valley region, before expanding to wider regions depending on need. Managers from non-NHS services, such as care providers, colleges, day centres, housing providers and advocacy

groups will be approached, and permission requested to provide details of the study to potential participants.

Once permission has been granted, the researcher will make a brief presentation about the study to groups regarding the research. Packs containing an information sheet and reply slip will also be given out. Those interested in participating in the study will be asked to return the reply slip to a designated member of staff. The researcher will also be available to answer any queries from potential participants directly. The details of individuals who wished to take part, or wanted further information about the study, will be passed on to the researcher by staff member(s). An arrangement for the assessment session will then be made with the participant.

Stage 3: Administration procedure

The session will be conducted at a location that is suitable for the participant, e.g. in a room at their day centre, college etc. Only the researcher and participant will be present for the session, though should the individual wish for a member of staff to be present this will be agreed. It is estimated that the full session will last approximately 1 hour 20 minutes, depending on ability of each participant.

Initially, there will be a review of the Information Sheet and discussion of the study to ensure that the participant comprehends the requirement of the study and that they can withdraw at any time. The process of the session will be as follows:

1. Consent gained and demographics questionnaire completed (10 minutes)
2. Order 1, 2, 3, or 4 of GSS presentation administered (with state anxiety measure administered following presentation of stimuli and prior to recall and questioning) (35 minutes)
3. Verbal (WAIS-IV Digit Span) and visual memory (Visual Patterns Task) assessments (15 minutes)
4. Two sub-test WASI-II (10 minutes)
5. Debrief (10 minutes)

This order has been chosen deliberately to ensure that perceived success, or otherwise, on the measures of cognitive ability do not influence performance on the adapted GSS.

5) Please list the principal inclusion and exclusion criteria (IRAS A17-1 and A17-2)

Inclusion:

- Mild intellectual disability (IQ 50 – 69; Diagnostic Statistical Manual version 5 [DSM-5], American Psychiatric Association, 2013; International Statistical Classification of Diseases and Related Health Problems 10th Revision [ICD-10], WHO, 1992).
- Aged 16 or over

Exclusion:

- Major mental illness, e.g. diagnosis of schizophrenia, current severe depression
- Dementia, or current query of dementia
- Current substance misuse
- Current involvement with forensic services
- Previous engagement with primary researcher in a therapeutic setting

6) How will data be collected?

All data will be collected by the primary researcher.

Demographic information

Information such as age, accommodation type, and employment status will be collected as part of an initial set of questions to be administered on the day of testing. These will be used to describe the sample as a guide to the generalizability of findings.

Dependent variable data

Suggestibility

The format for the Gudjonsson Suggestibility Scales involves the reading of a fictional story comprised of 40 verbal components with participants instructed to listen carefully. After a 50-minute delay, participants are then asked to recall as much about the story as they can. They are then asked 20 questions about the story, 15 of which are loaded with suggestion. The responses to these questions comprise the 'yield score'. After the first set of questions, participants are 'firmly' told "you have made a number of errors. It is therefore necessary to go through the questions once more, and this time try to be more accurate". The 20 questions are then repeated and any change in responses are noted ('shift score'). 'Yield' and 'shift' scores are obtained from the completed scale, as well as a 'total suggestibility' score.

In terms of reliability of items comprising the GSS, Gudjonsson (1984) reports alpha coefficients for yield and shift items of 0.88 and 0.82 respectively. A parallel version of the GSS 1 was later developed, the Gudjonsson Suggestibility Scale 2 (Gudjonsson, 1987). Interscorer reliability for the suggestibility scales ranges from .949 to .992 for the GSS 1, and .989 to .996 for the GSS 2 (Richardson & Smith, 1993).

For the purposes of this study, adapted versions of both the GSS 1 and GSS 2 will be used. The adaptations are detailed below:

No 50-minute time interval: Within the GSS, an existing suggested adaptation for individuals with intellectual disabilities is the removal of this delay. In order to maximize the recall of information, a fifty-minute delay will not be incorporated into the session and participants will be questioned about the story immediately following presentation.

Inclusion of visual information: In order to support performance on the task, the scale will be adapted to include visual as well as verbal information (as per Cardone & Dent, 1996). The visual information will be in the form of pictures depicting all 20 corresponding verbal components, e.g. if the verbal component is: 'they lived in a small bungalow', it will be accompanied by a picture of a small bungalow. Images will be laid-out in a 'storyboard' manner to allow the participant to understand the 'progress' of the story. Images in story order will therefore remain with the participant until the verbal passage has been finished being read out.

Reduced components: In this study, the number of components comprising the GSS 1 and GSS 2 will be halved, i.e. only the first half of the components will be used. As with the removal of the 50 minute interval, it is thought that using a reduced component version of the GSS 1 and 2 will support recall. A study by Willner (2008) found that this reduction of components can improve recall ability, therefore reducing the risk of obtaining a floor effect for free recall of information.

Wording of questioning: The usual procedures of the GSS would require the participant to be told in a "forceful manner" that there are inaccuracies in their story and that they must answer the questions a second time (Gudjonsson, 1984). In consideration of the individuals involved in this research project, "forceful manner" will be avoided, and instead participants will be told in a clear but directive way that the questioning will have to be repeated (e.g. "Unfortunately you got some of those answers wrong, so we will have to go through them again. I want you to try as hard as you can."). Deliberately less forceful wording has been adopted in studies previously, such as White and Willner (2005), and Willner (2008), without reducing the apparent levels of suggestibility.

Independent variable data:

Intelligence

The Wechsler Abbreviated Scale of Intelligence, Second Edition (WASI-II; Wechsler, 2011) is a brief intelligence test designed for individuals aged between 6 and 90 years. The two-subtest WASI-II, comprising 'vocabulary' and 'matrix reasoning' will be administered to all participants in order to obtain an estimate of their general cognitive ability (Full scale IQ). Administration time is estimated to be 10-15 minutes.

Verbal and visual memory

Verbal working memory will be assessed using the Digit Span sub-test of the Wechsler Adult Intelligence Scales 4th Edition (WAIS-IV; Wechsler, 2008). Administration time is estimated to be 5 minutes. Visual memory will be assessed using The Visual Patterns Test (VPT; Della Sala *et al.*, 1997). Authors estimate that the VPT has an administration time of 10 minutes. The VPT has good reliability and validity and is a more accurate measure of visual working memory, as opposed to other measures that merge both visual and spatial working memory capacities (Della Sala *et al.*, 1999). For the purposes of this study, a composite score for verbal and visual memory will be calculated.

State anxiety

A review by Hermans *et al.* (2011) highlighted the limited availability of assessment tools for measuring the anxiety of individuals with intellectual disabilities. In particular, there is an absence of a validated measure of state anxiety. Given this, relevant items from the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983), as adapted by Dagnan *et al.* (2008) for use with individuals with intellectual disability will be selected and administered in a form that addressed current feelings of anxiety.

Sample Size

7) What sample size is needed for the research and how did you determine this? (IRAS A59 and A60)

In order to estimate the required sample size for each of the research questions, two separate analyses were conducted

Research question i) Will the addition of visual materials to adapted Gudjonsson Suggestibility Scales reduce suggestibility?

Cardone & Dent (1996) found an effect size of 0.7 on 'yield' when visual stimuli were added to the GSS. Based on this effect size, a power calculation was conducted using an 'a priori' sample size calculator (G*Power; Faul, 2007). Estimations using this method are as follows:

Method of analysis	Two-tailed paired sample t-test
Desired statistical power	0.8
Anticipated effect size (based on previous research)	0.7
Probability level	0.05
<i>Required sample size</i>	<i>19</i>

Research question ii) Will the degree to which suggestibility is reduced be dependent upon the cognitive variables of IQ and visual and auditory memory?

A multiple regression will be used to explore the predictive qualities of the independent variables (IQ, memory, anxiety) against the dependent variable (change scores). A 'rule of thumb' outlined by Field (2009) recommends a minimum of 10 cases per predictor for a regression analysis. However, a more substantive assessment of required sample size was conducted. Significant relationships between the independent variables in this study and suggestibility scores have already been established from previous research (see Introduction). However, an effect size in relation to change score as an outcome variable is uncertain, although it is expected that these variables will be substantial contributors to the degree to which scores on the GSS alter. As a result, sample size was calculated for a medium-to-large effect size (see below). Once again, the power analysis was conducted using an 'a priori' sample size calculator (G*Power; Faul, 2007).

Method of analysis	Multiple regression
Anticipated effect size	0.25 (medium-to-large)
Desired statistical power	0.8
Number of predictors	3
Probability level	0.05
<i>Required sample size</i>	<i>48</i>

8) Outline reasons for your confidence in being able to achieve a sample of at least this size.

The recruitment stage of this study is planned to run from January until October 2016. It is hoped that the length of this stage will maximise recruitment and also allow time for approaching wider services, and problem solving should any unforeseen difficulties arise. In her study that also recruited participants with an intellectual disability, Paterson (2007) achieved an encouraging response rate of 74% of those individuals able to consent. As such, the sample size appears achievable given the similarities in the methods of recruitment with this present study. The clinical supervisor of this project has extensive experience of ID services throughout Forth Valley. The academic supervisor of this project has experience working within Ayrshire & Arran, Greater Glasgow & Clyde and Lanarkshire, and a number of contacts working in intellectual disability services in Lothian.

Analysis

9) Please describe the methods of analysis (statistical or other appropriate methods (IRAS A62)

All descriptive and inferential statistical analyses will be conducted using SPSS. Assumptions relating to the collected data will be examined, e.g. normality distribution.

Research question i) Will the addition of visual materials to adapted Gudjonsson Suggestibility Scales reduce suggestibility?

A two-tailed paired sample t-test will be used to explore the differences between mean suggestibility score without and with visual stimuli. Primary analysis will look specifically at total suggestibility scores, and secondary analyses will explore Yield and Shift scores. Appropriate measures (e.g., Holm-Bonferroni corrections) will be taken to account for any familywise error rates that may result from multiple comparisons (Pallant, 2005).

Research question ii) Will the degree to which suggestibility is reduced be dependent upon the cognitive variables of IQ and visual and auditory memory?

A multiple regression will be used to explore the predictive qualities of the independent variables (IQ, memory, anxiety) against the dependent variable (change in yield scores).

Project Management: Timetable

10) Outline a timetable for completion of key stages of the project.

Year	Month	Stage	Notes
1 st	July 2015	Submission of research proposal	- Wait for response/suggestions

1 st	Aug – Oct 2015	Finalise research plan Prepare relevant ethics applications	<ul style="list-style-type: none"> - Develop participant information forms, including seeking feedback re readability - Assemble resources needed, e.g. photos for GSS 1 & 2 - Seek and incorporate feedback from supervisors for ethics application - Finalise recruitment sources, discuss with Clinical supervisor and other members of clinical team within local learning disability department. - Determine final list of what participant access permissions will need to be obtained, e.g. local Council, colleges.
2 nd	End of Oct 2015	Submit ethics Data prep work	<ul style="list-style-type: none"> - Wait for response - Plan structure of thesis - Create secure database - Establish secure location for physical data storage - Independent verification of GSS 1 & 2 pictures and content similarity
2 nd	Jan - March 2016	Start recruitment in local area (pending favorable ethical decision)	- Begin recruitment in Forth Valley before widening to other areas.
2 nd	March – Oct 2016	Continue recruitment and data collection Write up - Methodology - Introduction	<ul style="list-style-type: none"> - Input data into database - Start first half of introduction - Supervisor feedback re methodology
2 nd	July - Aug 2016	Data analysis	<ul style="list-style-type: none"> - Conduct analyses - Interpret analyses - Supervisor feedback re analyses
2 nd	Sept 2016	Write up - Results - Re-draft introduction	- Supervisor feedback re results

3 rd	Oct 2016	Systematic review	- Refine question - Plan
3 rd	Nov 2016 – Jan 2017	Systematic write up - Introduction - Analyses	- Supervisor feedback re introduction and analyses
3 rd	Feb 2017	Finish systematic review	- Discussion - Supervisor feedback
3 rd	March 2017	Final thesis write up	- Finish outstanding sections - Finalise referencing - Formatting - Binding
3 rd	April 2017	Final thesis draft to supervisors	
3 rd	May 2017	Final submission of thesis	
3 rd	June - July 2017	Prepare for viva Plan disseminations	- mock vivas with supervisors - commence application for relevant publications
3 rd	Aug 2017	Submit for publications	

Management of Risks to Project

11) Please summarise the main potential risks to your study, the perceived likelihood of occurrence of these risks and any steps you will or have taken to reduce these risks. Outline how you will respond to identified risks if they should occur.

Recruitment: There is dependency on service managers' agreement to allowing the researcher access to speak to clients within their services. They will also be required to support recruitment by providing information on individuals who may be interested to the researcher. It is the researcher's responsibility to develop positive relationships with all involved, so as to facilitate the progression of the study. In her study, Paterson (2007) acknowledged a generally willingness and enthusiasm of service managers and other staff to facilitate her research and permit access clients within their services. All efforts will be made to foster positive relationships with service managers both through the researcher and her supervisors.

Researcher Illness: All stakeholders (e.g. the University, academic and clinical supervisors, NHS Forth Valley) will be informed should the researcher require significant leave for any unforeseen reason. Contingency plans will be discussed amongst the stakeholders, e.g. extending the recruitment period.

Supervisor absence: Should the clinical supervisor be unable to fulfil their duties (as agreed in the supervision contract), an alternative local clinical practitioner will be approached with the support of the researchers clinical line manager. Similarly,

should the academic supervisor become unable to fulfil their role (as also agreed in the supervision contract) for any reason, the University will be contacted and a replacement supervisor will be designated.

Potential distress to participants: The measures in this study have been widely used in other research, and wording has been adapted where possible to improve suitability for participants with intellectual disabilities. Although there does not appear to have been any concerns raised in previous research, there is a small risk that distress may result from the events depicted in the GSS 1 and/or 2 scales (i.e. a description of a woman having her handbag stolen, and a boy losing control when cycling his bicycle). It will be the researcher's responsibility to identify if the participant becomes distressed or upset during the session and take necessary action in a sensitive manner. The Information Sheet given to the participant at the start of the study will state clearly that should the content of the study trigger any distress or confusion, they are advised to contact the primary researcher, a member of their staff, or their GP for support. This will be emphasised verbally when the researcher gathers consent and at the debrief following testing. Contact details for the primary researcher will be detailed on both the study information and debrief documents. Similar recommendations will be made on the information sheet provided for carers/parents should they have any concerns.

Identification of risk: Should any risk or concerns be identified regarding the care provision for individuals that the researcher comes in contact with, the researcher has a professional responsibility to report to the appropriate authorities e.g. to the Care Inspectorate, relevant Adult Support and Protection bodies. Should information be disclosed regarding any risk of harm to the participant or risk of harm to others, this shall be managed with clinical judgement and with sensitivity. The duty to disclose such information will be made clear within the study Information Sheet and related verbally when consent is taken. Any issues in relation to this will be discussed with supervisors and appropriate steps taken to safeguard individuals. It is the researcher's responsibility to manage this disclosure appropriately, e.g. the welfare of the individual will be paramount, and appropriate authorities will be informed.

Capacity: As the population under study are individuals with a significant impairment of intellectual functioning, it is the responsibility of the researcher to be mindful of individuals' capacity to consent to participation. This will be informally assessed during the sharing of information about the study, and during the consent process. The individual will be deemed to have the capacity to consent to taking part in the study should they:

- Understand the nature of what is involved in the study
- Be able to retain the information provided
- Understand and weigh up the implications of taking part in the study

Equally, should the researcher have doubts at any stage during the study (after participant has consented) that the individual may not meet the criteria above to consent to taking part in the research, the ending of the session will be managed carefully and the individual will be debriefed sensitively. Should this occur, the individual's data would be destroyed securely, and not included within the rest of the study data.

Consent, confidentiality and data protection: It will be made clear to individuals that their participation is voluntary and they can withdraw their consent to take part in the

study at any time. Confidentiality during participation in the study will be explained, as well as the limits to confidentiality, e.g. should risk to self/others be disclosed.

Following data collection, all identifiable information will be anonymised and coded for the researcher's purposes only. All data will be held securely (i.e. in a locked case if in transit) and will be stored securely within an NHS Forth Valley Psychology department. Data will be anonymised in advance of it being inputted into a computerised database which will be password protected.

Missing data: There is only a very small risk of missing data, as the researcher will collect the majority of the data during a single session with the individual.

Knowledge Exchange

12) How do you intend to report and disseminate the results of the study? (IRAS A51)

During the study debrief, participants will be asked if they wish to receive an accessible written summary of the results. Results will also be disseminated to the relevant services involved using whatever method may be desired, e.g. a summary report, presentation. The results of the study will also be disseminated via research papers at relevant national and international conferences. Where appropriate, results will also be disseminated to relevant Special Interest Groups (SIGs). Relevant journals will also be identified and journal articles will be submitted (e.g. Journal of Personality and Individual Differences, Journal of Intellectual Disability Research).

13) What are the anticipated benefits or implications for services of the project?

It is possible that this study will lead to the further development of a tool that can reliably measure interrogative suggestibility for people with intellectual disabilities. More generally, this research aims to contribute to the theoretical development of the concept of suggestibility, whilst increasing the understanding and awareness of the factors that should be taken into consideration when assessing an individual's suggestibility.

14) Are there any potential costs to this project?

University costs

Measures: As the GSS 1 and 2 will be adapted, there are no additional costs for accessing more than one GSS 1 and 2 score sheet (which the researcher already has access to). The GSS manual can be obtained from the University via academic supervisor. The VPT materials are free to use and can be obtained from the academic supervisor. A measure of digit span will be extracted from the WAIS-IV and will therefore not require purchase of a score sheet.

Permission has been granted by Forth Valley's Head of Primary Care Psychology to access the WASI-II from the department. 50 score sheets for the WASI-II will be required, at a cost of £159.60 (incl. VAT) + £4.50 delivery. An application will be submitted to the University requesting funding for these costs.

NHS Health Board costs

Provisional approval has been obtained from the researcher's NHS line manager (Dr Sally Rankine) and Head of Forth Valley's Psychology Services (Dr Jennifer Borthwick) for the below costs to be paid for by NHS Forth Valley:

Paperwork: printing of Information Sheets etc., and photocopying of paperwork (estimated to be 500 black and white, 200 colour). Preparation of visually adapted GSS 1 and 2 (20 colour pictures on laminated sheets for each).

Postage costs: for posting study information packs to relevant parties (i.e. service managers). It is estimated that up to 40 services will be contacted and given information packs regarding the study. It is not anticipated that all will request posted information so this is likely to be an overestimate of postage costs.

Travel costs: For researcher travel to and from participants from base (Falkirk Community Hospital) to locations throughout Forth Valley, and possibly other regions.

15) Any other relevant information.

The researcher has 24 months of previous experience working as a Support Worker within a private intellectual disabilities support service, as well as having completed the six-month intellectual disability clinical practice placement as part of the Doctorate of Clinical Psychology training.

16) Key References

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders: DSM-5. Washington, D.C: American Psychiatric Association.

Bailey, R., Willner, P. & Dymond, S. (2011). A visual aid to decision-making for people with intellectual disabilities. *Research in Developmental Disabilities*, 32, 37–46

Beail, N. (2002). Interrogative Suggestibility, Memory and Intellectual Disability. *Journal of Applied Research in Intellectual Disabilities*, 15. 129 – 137.

Bowden, K. M. (1998). *Interrogative suggestibility of people with a learning disability – the influence of mode of assessment*. (Unpublished doctoral thesis). University of Glasgow, UK.

Bryant, D. P., Goodwin, M., Bryant, B. R., & Higgins, K. (2003). Vocabulary instruction for students with learning disabilities: a review of the research. *Learning Disability Quarterly*, 26(2). 117 – 128.

Cardone, D. & Dent, H. (1996). Memory and interrogative suggestibility: The effects of modality of information presentation and retrieval conditions upon the suggestibility scores of people with learning disabilities. *Legal and Criminological Psychology*, 1. 165 – 177.

Dagnan, D., Jahoda, A., McDowell, K, Masson, J., Banks, P. & Hare, D. (2008). The psychometric properties of the hospital anxiety and depressions scale adapted for use with people with intellectual disabilities. *Journal of Intellectual Disability Research*, 11. 942 – 949.

Della Sala S, Gray C, Baddeley A, Wilson L. (1997) The Visual Patterns Test: A new test of short-term visual recall. Thames Valley Test Company. Feltham: Suffolk, UK

Della Sala S, Gray C, Baddeley A, Allamano, N., & Wilson L. (1999) Pattern span: a tool for unwelding visuo-spatial memory. *Neuropsychologia*, 37. 1189-1199

Drake, K. E., Bull, R., & Boon, J. C. W. (2008). Interrogative suggestibility, self-esteem, and the influence of negative life events. *Legal and Criminological Psychology*, 13. 299 – 307.

Drake, K. E., & Bull, R. (2011). Life adversity and field-dependence: individual differences in interrogative suggestibility. *Psychology, Crime and Law*, 17. 677 – 687.

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175-191

Field, A. P. (2009). *Discovering Statistics using SPSS: and sex and drugs and rock n' roll* (third edition). London: Sage Publications.

Gudjonsson, G. H. (1984). A new scale of interrogative suggestibility. *Personality and Individual Differences*, 5(3). 303 - 314.

Gudjonsson, G. H. (1987). A parallel form of the Gudjonsson Suggestibility Scale. *British Journal of Clinical Psychology*, 26. 215 - 221.

Gusjonsson, G. H., & Lister, S. (1984). Interrogative suggestibility and its relationship with self-esteem and control. *Journals of the forensic science society*, 24(2), 99 – 110.

Hansdottir, R., Thorsteinsson, H. S., Kristinsdottir, H & Ragnarsson, R. S. (1990). The effects of instructions and anxiety on interrogative suggestibility. *Personality and Individual Differences*. 11(1). 85 – 87.

Hermans, H., van der Pas, F. H. & Evenhuis, H. M. (2011). Instruments assessing anxiety in adults with intellectual disabilities: A systematic review. *Research in Developmental Disabilities*, 32(3), 861-870

Howells, K. & Ward, M. (1994). Intellectual impairment, memory impairment, suggestibility and voir dire proceedings: a case study. *Medicine, Science & the Law*, 34, 176 – 180.

Loftus, E. F., & Palmer, J. C. (1974). Reconstruction of automobile destruction: An example of the interaction between language and memory. *Journal of verbal learning and verbal behavior*, 13(5), 585 - 589.

Pallant, J. (2005). SPSS Survival Manual (Third Edition). UK: Open University Press.

Paterson, L. (2007) *Stigma, social comparison and psychological distress in adults with a learning disability*. (Unpublished doctoral thesis). University of Edinburgh, Edinburgh, Scotland.

Richardson, G. & Kelly, T. P. (2004). A study in the relationship between interrogative suggestibility, compliance and social desirability in institutionalised adolescents. *Personality and Individual Differences*, 36(2), 485 – 494.

Richardson, G., & Smith, P. (1993). The inter-rater reliability of the Gudjonsson suggestibility scale. *Personality and Individual Differences*, 14, 251 – 253

Ridley, A. M. (2013). Suggestibility: a history and introduction. In A. M. Ridley, F. Gabbert & D. J. La Rooy (Eds.), *Suggestibility in legal contexts: psychological research and forensic implications*. Oxford, UK: John Wiley & Sons. Pp 1-19.

Sporer, S. L. (1982). A brief history of the psychology of testimony. *Current Psychological Reviews*, 2, 323 – 339.

Wechsler, D. (2011). *Wechsler Abbreviated Scale of Intelligence - Second Edition*. San Antonio, TX: Pearson.

Wechsler D. (2008). *Wechsler Adult Intelligence Scale - Fourth Edition*. San Antonio, TX: Pearson.

Willner, P. (2008). Clarification of the memory artefact in the assessment of suggestibility. *Journal of Intellectual Disability Research*, 52(4). 318 – 326.

Willner, P. (2011). Assessment of capacity to participate in court proceedings: a selective critique and some recommendations. *Psychology, Crime & Law*, 17(2). 117 – 131.

White, R. & Willner, P. (2005). Suggestibility and salience in people with intellectual disabilities: An experimental critique of the Gudjonsson Suggestibility Scale. *The Journal of Forensic Psychiatry & Psychology*, 16(4). 638 – 650.

Wolfradt, U & Meyer, T. (1998). Interrogative suggestibility, anxiety and dissociation among anxious patients and normal controls. *Personality and Individual Differences*, 25 pp. 425-432.

World Health Organization. (1992). The ICD-10 classification of mental and behavioural disorders: Clinical descriptions and diagnostic guidelines. Geneva: World Health Organization.

Zigmond, A.S., & Snaith, R.P. (1983). The Hospital Anxiety And Depression Scale. *Acta Psychiatrica Scandinavica*. 67, 361 – 370.

17) Confirmation of Supervisors' Approval

I confirm that both my academic and clinical supervisors have seen and approved this research proposal and have both completed the supervisors' appraisal forms below.

Yes .Proposal

Appendix 1:

Methodological Review

Main Academic Thesis Supervisor's Appraisal of Project Risk

Supervisor's Name: Dr Ken MacMahon

Do you consider that the project should proceed in broadly its current form?

(Delete as appropriate)

Yes, subject to considerations outlined below

Please outline the reasons for your response. In particular, highlight any areas of risk to the completion of the project that have not been fully addressed within the proposal and any steps that could be taken to reduce risks:

I believe that this project examines an area that is of theoretical interest, as well as of significant importance in clinical practice. The issue of suggestibility is most likely to arise with people with intellectual disabilities (both for victims and alleged perpetrators). Hence, this study would be a valuable addition to the literature.

As noted in the proposal, the most significant risk is in relation to the recruitment of participants. However, the proposed study does not seek to recruit patients from the NHS which reduces recruitment difficulties substantially. Nonetheless, it is expected that the researcher will be required to make links with organisations, such as care providers and colleges. It will be necessary to concentrate efforts on this at an early stage, to ensure sufficient potential participants.

Planning the process of approaching specific organisations, in a systematic fashion, rather than an initial approach to a very wide group of service providers, will be necessary to minimise the time spent visiting numerous services. Attempting to recruit several individuals from each organisation should also reduce the time commitment required. Recognising when it may be necessary to move outwith Forth Valley (to facilitate recruitment) will be necessary at an early stage. If this is needed, then approaching services with whom the project supervisors have an existing relationship with would be likely to facilitate more rapid recruitment.

With regard to other risks, such as distress to participants and capacity issues, I believe that these have been addressed within the proposal.

Date: 11th July 2015

Appendix 2:
Methodological Review

Clinical Thesis Supervisor's Appraisal of Project Risk

Supervisor's Name: Dr Edith Matheson

Position: Chartered Clinical Psychologist

Do you consider that the project should proceed in broadly its current form?
(Delete as appropriate)

☒ Yes

Yes, subject to revisions outlined below

No

Please outline the reasons for your response. In particular, highlight any areas of risk to the completion of the project that have not been fully addressed within the proposal and any steps that could be taken to reduce risks:

*This project appears to have been well researched by
Hannah and is of clinical value.*

I have no particular concerns re: risk.

E Matheson

Date: *23/07/15*